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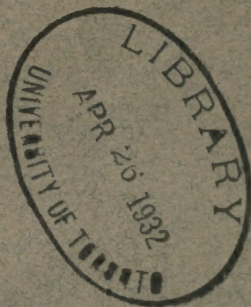
SOME SCIENTIFIC CONCLUSIONS

CONCERNING

THE ALCOHOLIC PROBLEM AND ITS
PRACTICAL RELATIONS TO LIFE

PAPERS READ AT THE SEMIANNUAL MEETING
OF THE AMERICAN SOCIETY FOR THE STUDY
OF ALCOHOL AND OTHER DRUG NARCOTICS, AT
WASHINGTON, D. C., MARCH 17, 18, AND 19, 1909

Dr. Crothers would appreciate any
notice you may make of this paper.



PRESENTED BY MR. GALLINGER

MAY 17, 1909.—Ordered to be printed

WASHINGTON
GOVERNMENT PRINTING OFFICE

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INTRODUCTORY NOTE.

The following papers were read at the semiannual meeting of the American Association for the Study of Alcohol and Other Narcotics, held in Washington, D. C., March 17, 18, and 19, 1909.

This association was organized in 1870, and is composed exclusively of physicians and scientific persons interested in the exact study of alcohol and the diseases associated with and following from its use.

This was the first effort of medical men in modern times to take up the alcoholic problem as a strictly scientific study, and for over twenty years was the only society in the world discussing this subject.

At present there are two similar societies in Europe, and for many years great congresses have been held every two years in different parts of Europe for the general discussion of this problem.

These papers are presented as the most authoritative contributions and conclusions to this subject, and not only indicate what has been done, but point out great possibilities for further and more exact work.

Their practical value will be evident to every reader, particularly as they cover several most important phases of the subject, especially the latest studies of the action of alcohol on the cell and tissue, and the influence of certain causes, also means of treatment and possibilities of restoration and prevention.

The publication and dissemination of these papers will be welcomed in every section of the country for the reason that they supply authoritative conclusions and facts from the latest medical studies that are unquestionable.

It is only from contributions of this character that the public can learn the real facts and their application in the means of prevention and cure.

The secretary of this association is Dr. T. D. Crothers, of Hartford, Conn.

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PAPERS GIVING CONCLUSIONS FROM RECENT LABORATORY
RESEARCHES CONCERNING THE ACTION OF ALCOHOL
ON CELL AND TISSUE.

LESIONS OF THE NERVE CELL AND VASCULAR TISSUES PRODUCED BY ACUTE EXPERIMENTAL ALCOHOLIC POISONING.

By HENRY J. BERKLEY.

Clinical professor of psychiatry, Johns Hopkins University, Baltimore.

The effect of ethyl alcohol, in its pure form, upon the organism differs in some ways from that of spirituous liquors of which it is the chief constituent, doubtless from the fact that certain ethers are present in the spirits and absent from the alcohol. The first result, after the ingestion of a moderate quantity of ethyl alcohol in man—a fluid ounce, for example, of absolute alcohol properly diluted—is to cause a fall of from 15 to 20 beats a minute in the heart's action, accompanied by some hardening of the quality of the pulse. This is followed, almost immediately, by a feeling of muscular lassitude, then mental confusion, both of which increase gradually, and in an hour or two are lost.

A few instances of its more continued effects on man may be cited. One man of 40 years, who voluntarily subjected himself to a months' course of ethyl alcohol, in daily doses, beginning with 2 ounces and gradually increasing to 4 ounces, taken mainly in the late evening, exhibited the following symptoms: After the initial vascular disturbance came considerable mental confusion, inability to control the voluntary muscles, and intense sleepiness. On the following morning, after a period of from six to seven hours profound sleep, there was considerable irritability of the heart's action, which persisted up to 3 or 4 o'clock the following afternoon, mental lassitude, and difficulty in keeping up with the daily routine work. By the end of the month there was well-marked and persistent irritability of the heart's action, palpitation, at times a feeling of praecordial anxiety with some difficulty in the respiration, a pulse showing a considerable increase in tension, and decided evidence of dilatation of the peripheral arteries, the indications of beginning fatty changes in the heart and muscularis of the blood vessels. With these symptoms were others indicating a considerable digestive disturbance in the form of mucous diarrheas, neuralgic pains in the forehead and limbs, together with a lessened ability to think clearly at any time, and mental irritability. When the alcohol was stopped, all the symptoms, inclusive of the arterial dilatation receded rapidly, and soon disappeared.

A second individual, who drank 95 per cent alcohol as a beverage in the place of whisky, to the extent of a pint or more a day, at the end of three months exhibited profound mental changes in the form of pronounced loss of memory for recent events, delusions of persecution;

and on the somatic side, profound cutaneous anesthetics, with loss of the knee jerks and other deep reflexes, also the indications of a fatty heart muscle and dilated arteries. Tremor, loss of tone of the musculature, difficulty in articulation, incoordination of the voluntary movements, as well as lancinating pains in the lower extremities were also noted. He recovered almost completely after a three months' sojourn at a sanitarium.

In a third individual—a physician—who consumed a liter bottle of absolute alcohol a day for a period of three months, the changes were more profound. The heart's action grew weak, weaker and more irregular, complete anesthesia of the skin surfaces, with entire loss of the deep and superficial reflexes supervened. With these came various visceral paraesthesias; then a rapid dementia began, which soon became profound, and shortly after the end of the three months he died from failure of the heart's action.

The ingestion of large quantities of ethyl alcohol is always followed by profound disorganization of the cardiac functions, and a single dose of 6 or 8 ounces may be followed by rapid death even in persons who are accustomed to the habitual use of spirits. In these instances there is a gradual lowering of the circulation, subnormal temperature, bluing of the extremities, and a gradual slacking of the cardiac action until the exitus.

The microscopic pathological effects of acute alcoholic poisoning upon the human organism is practically unknown, nor is it possible to obtain material for these examinations in sufficiently fresh condition from cases of delirium tremens that have died as a result of their debauches, as it is from the tissues of the lower animals that have been subjected to practically the same course of treatment. We have therefore availed ourselves of the material, furnished during the course of certain studies by Dr. Julius Friedenwald, upon the effects of alcohol on the tissues of rabbits. The alcohol was administered in slowly increasing doses until the animal had established a certain tolerance to the drug, then increasing it to a considerable amount, which was maintained until the animal died.

While the quantity given the animals was large, it can hardly be said to exceed the amount taken by many men while on a protracted debauch, and from which they eventually recover, perhaps, after an attack of delirium tremens or other alcoholic psychosis, and fell considerably below that of the man cited above, who took a liter a day.

Thus an individual weighing 150 pounds would take in the same proportion fifty times the quantity of alcohol of a 3-pound rabbit, and accordingly would attain a daily allowance of 750 cubic centimeters absolute alcohol, equal to about 1,500 cubic centimeters of ordinary whisky, with the difference that the ethyl alcohol is perhaps less deleterious to the tissues than the blended whiskies of commerce.

Three rabbits were used in this study:

Rabbit A, weighing 1,220 grams, received 5 cubic centimeters diluted alcohol on September 26, and the amount was gradually increased up to 15 cubic centimeters a day, which was maintained until October 21, the date of death. In all he received 190 cubic centimeters alcohol. After the exitus the body weighed 780 grams, and at the autopsy the principal microscopic lesion was a fatty degeneration of the heart muscle.

Rabbit B weighed 1,500 grams on September 30, and from that date received a daily allowance of from 5 to 15 cubic centimeters alcohol, and died on October 21, at which time he weighed 840 grams; also, in this case the chief demonstrable lesion was a fatty heart. The total amount of alcohol consumed by this rabbit was 165 cubic centimeters.

Rabbit C weighed 1,490 grams. The administration of the drug in the same quantities was begun on October 2, and death resulted on October 25, by which time the weight had been reduced to 920 grams. This animal died in convulsions after having received a total of 260 cubic centimeters alcohol. A fatty heart was again found.

One point of considerable interest to be noted in this experiment is that the resistance of the several animals to the poison is not proportionate to their weight, but to some inherent property in their tissues; thus, the heaviest one received only 165 cubic centimeters, and the next heaviest, weighing 10 grams less, received 260 cubic centimeters before death resulted. In all the rabbits nutrition was kept up as well as possible by giving them suitable and dainty food.

THE HISTOLOGICAL EXAMINATION.

The tissues derived from the three rabbit brains were hardened in absolute alcohol and in Muller's fluid, while the staining for microscopic examination was done by the Nissl method, various nuclear dyes, and the silver phospho-molybdate procedure.

The results are separable into three divisions, according to the various elements involved, which may be briefly given as—

Blood vessels.....	Damage positive.
Nerve cells.....	Damage positive, yet not so profound as in the cells of the blood channel walls.
Neuroglia.....	Damage positive as to the lymphoidal elements, negative for the support neuroglia.

We will consider in their order these various pathological changes.

THE BLOOD VESSELS WITH NUCLEAR STAINS.

ARTERIES AND INTERMEDIARY VESSELS.

The nuclei of the endothelial cells are everywhere swollen, in places are fragmented, and receive either too little or too much of the dye. The cellular protoplasm is also undergoing definite retrogressive alterations. The cells of the intermediary vessels look as if they had been subjected to severe strain (dilatation of the blood vessel), as their even contours are distorted, and there are many irregular bulges in the walls.

The changes in the muscular layer are equally interesting. Nuclei are here and there absent over considerable areas of the middle wall of the vessel, and in those that remain certain abnormalities are apparent, the nucleus being badly stained, either wholly or in part. It is, however, in the substance of the muscular protoplasm that the lesions are most apparent, and show that the cells themselves are being subjected to a morbid process. They no longer have the substance clearly stained, but it is turbid, even hyaline in appearance. The protoplasm, too, is considerably swollen, and its receptive quality to the aniline dye is no longer good.

The Virchow-Robin lymph space is entirely obliterated by the swelling, and in those portions of the structure where the tumefaction is most pronounced there is also an almost complete obliteration of the His lymph space, the outer lamina of the vessel being closely pressed against the limiting lining of the peripheral edge of the perivascular space.

Changes in the adventitia are not nearly so distinct as in the two inner coats, though in places it holds considerable numbers of leucocytes, or these may be packed between it, in considerable numbers, and the outer wall of the lymph space. These white blood corpuscles are necrotic and swollen.

The contents of the perivascular spaces, where the degree of compression is insufficient to obliterate them, is interesting and instructive. In them are large numbers of leucocytes in all stages of disintegration, and, besides, there are frequently a number of protoplasmic bodies, several times the size of a polynuclear leucocyte, very granular, and without nucleus, that are, probably, formed from the remains of the partially disintegrated lymphoid corpuscles that have aggregated into crescentic or ovoid shapes. Besides these partly organized bodies there is a quantity of detritus, finely granular in character, insufficient to cause, without the aid of the lymphoid cells, any blocking of the lymph currents. Osmic acid produces a slight blackening of the degenerating white corpuscles, as well as of the detritus within the lymph spaces, showing that fatty changes are present.

The capillaries, like the intermediary vessels, are twisted and tortuous, the nuclei show changes similar to those in the larger vessels, while the cell bodies have departures from the normal in staining qualities, and here and there in the lumen are plugs of white blood corpuscles, which, from their closely packed appearance, must have entirely stopped the circulation of the blood in these vessels before death. The lumen, beyond these plugs, is entirely devoid of contents.

VEINS.

Changes in the coats of these vessels is similar to those in the arterial system, but aggregations of dying polynuclear corpuscles are more frequent, and are by far the most striking feature both of their contents and surroundings.

These aggregations, which in the small vessels may vary from three or four to more than a dozen, are located both within and without the lumen. Within the lumen are collections of white blood cells filling the interior, while numbers are seen penetrating the walls. So vast are the collections in the perivenous spaces that the whole cavity is occasionally tightly filled, and the back pressure from the plugs as well as the compression of the vessel from the outside has attained such a height that in a number of instances the vessels' walls have ruptured, and red corpuscles are intermingled with the white ones and completely fill the His space. In one instance the site of the rupture was located in the section.

All the leucocytes, both within and without the veins, show, with aniline stains, more or less evidence of disintegration, in some instances extending to complete disintegration of the cell.

ARTERIES.

The medium-sized and larger arteries show individual differences as to the extent that they are affected by the morbid process. This difference would appear to depend largely upon the numbers of lymphoidal plugs in the arterioles and capillaries, for where they are thickly scattered there the degree of arterial degeneration is greatest, and particularly is this true for the muscular layer. It would accordingly appear that at some period antedating the death of the animal aggregations of leucocytes formed in the smallest vessels, and a slowly increasing backward pressure began upon the arteries, insufficient to occasion complete stasis, but enough to create unusual pressure upon them; accordingly, this pressure in combination with the poisonous effects of the alcohol carried with the current of nutritive plasma, caused degeneration of the cellular elements forming the vascular walls, the main stress of the active process falling upon the inner coats of the arteries.

This severely increased blood pressure is probably only an exaggeration of what ordinarily follows the administration of a moderate dose of spirits. Following this ingestion comes a dilatation of all the arteries of the body from the paralyzing effect of the drug upon the vaso-constrictor nerve fibers, and this endures for a variable time according to the quantity of alcohol partaken of.

The mechanism of the cerebral arteries—in that they do not possess vaso-constrictor nerves, but are dependent upon the inherent contractility of the muscularis and other elements—allows of a greater influx of the alcoholic poison into the brain than elsewhere. The vascular muscular cells, under the influence of the direct action of the poison and free from extraneous nerve influences to urge them to a return to normal state, remain for a long time inert, the congestion of the cerebral tissues is long continued, larger amounts of poisoned blood pass through the brain, and incidentally a larger proportion of alcohol than to other ordinary tissues, such as the muscles. As a result the deteriorated serum, laden with the poison, is transuded in increasing quantities through the capillary walls, it is carried to the lymph spaces surrounding the principal cerebral cells, their structures are bathed in the diluted alcohol, their activity is dulled by its narcotic action, and inertia and torpor of the functional activities are the result; finally, it is only after the entire elimination of the poison from the system that they resume their normal functions.

If the amount of the poison to which the tissues are subjected is very considerable, as well as continued from day to day, and the excretory functions become clogged for a long time, the damage to the vascular walls is proportionally greater. In the light of the present experimental cases, the damage may proceed to necrotic changes in the endothelial lining and muscular layer; leucocytes, formed in other portions of the body, mass in the cerebral vessels, in part from the increased quantity of blood brought by the arteries not being promptly carried off by the venous channels, and accordingly we find a constant accumulation of the white corpuscular elements, terminating finally in blocking of the capillaries as well as of the smaller veins, diapedesis, choking of the perivascular lymphatic channels, and eventually damage both to the walls of the arteries by back pressure

acting on a tissue already prone to undergo degenerative changes from the deleterious effects of a poisonous drug, and to the veins from abundant extravasations and transudations of the white corpuscular elements.

NERVE ELEMENTS.

Changes in the nerve cells, while definite to a certain degree, are by no means so intense as in the mesoblastic vascular structures. With aniline dyes positive degenerative changes are best determined in the neighborhood of the more extensively embolized vessels. Here the nerve cell bodies do not show the normal Nissl staining, but appear uniformly and finely granular, also they do not take up nearly so much of the dye as cells that are located in areas in which damage to the blood vessels is less severe. In the degenerated cells alterations in the nucleus and nucleolus are beginning, principally noticeable in the swollen and spongy state of the nucleolus, but the damage is not nearly so extensive or positive as in chronic alcoholism.

The silver-molybdate method shows more extensive changes than the Nissl, but these are confined entirely to the cell branches, which are invisible in preparations by the latter method. The departures from the normal in the dendritic extensions do not appear everywhere throughout the section, but like those noticeable in the aniline preparations are most definite where vascular damage is greatest.

The departure from the normal in the dendrites is shown by extensive and irregular swellings in the course of the branches, extending over considerable distances in their long diameter, which suddenly decrease to the normal caliber of the stem. The majority of the lateral buds, or gemmulæ, are lost over the areas of tumefaction, though here and there damaged ones may be found projecting from the sides of the enlargement. Even the dendritic stems that have no swellings have a considerable diminution of the number of the lateral buds, and those that remain have lost a part of their natural characteristics, the rounded knob of the pear-shaped bud being lost, while the part that remains is seen as a short, even projection from the sides of the protoplasmic stem. Often, also, those remaining have a greater thickness than is customary, from the insertion to the termination. Accordingly, it would appear that the remaining parts of the lateral buds were swollen. In places where the destructive process has been greatest, the gemmulæ are entirely stripped off from the parent branch.

So far as could be determined the axis cylinder and its collaterals are not implicated in the destructive process.

NEUROGLIA.

With the aniline stains there is no increase of fixed nuclei among the tissues, nor could this be expected in a semiacute process. With the silver stain the support elements present no variations from the control. On the other hand the vascular neuroglia—belonging as it does to the lymph excretory system of the brain—gives distinct evidence that the stress of excreting a vastly increased amount of detritus, from the rapid tissue changes present, as well as from working at a disadvantage under the narcotic influence of the alcohol contained in the nutrient serum, has been too much for its capacity.

The cell bodies are larger, the protoplasmic extensions are thicker and more knotty, and the channeled arms extending to the perivascular spaces of neighboring blood vessels are more prominent than in control preparations.

CONCLUSIONS.

1. In acute alcoholic poisoning, the stress of the action of the drug falls upon the tissues of the blood vessels' walls rather than upon the nervous elements of the brain.
2. The involvement of the nerve elements is more gradual than that of the mesoblastic tissues, and only becomes noticeable by present methods of staining and examination, after the lymphatic channels are choked with the detritus of white blood corpuscles and other cellular elements.
3. Nevertheless, the deteriorative action of ethyl alcohol on the nerve cell is apparent, and when prolonged, in more moderate doses than was administered to the three rabbits, produces well-defined cellular changes, as is evidenced by nucleolar and dendritic changes.
4. In its action on the nervous tissues ethyl alcohol may be likened to certain other poisons, such as ricin or the toxalbumins. The administration of these toxins causes the same departures from the normal in the nerve elements, but the alcohol has a much greater destructive effect upon the white blood cells, as well as the cells composing the blood vessel walls.
5. The effect of the drug is proportionate to the quantity administered to the animal, as well as to the duration of its poisonous action before death ensues. Limited quantities continued over a considerable time accomplish, in modified form, the same destructive result as higher doses acting during a few days.

TEACHINGS FROM LABORATORY RESEARCHES ON THE ACTION OF ALCOHOL ON THE CELLS AND TISSUES.

By WINFIELD S. HALL,

Professor of physiology, Northwestern University Medical School, Chicago; president of the Society for the Study of Alcohol and Other Narcotics.

As indicated in the name of our organization this society was founded "for the study of alcohol and other narcotics." We are therefore *a society of students*, approaching controversial questions with open minds, *seeking the truth*.

It may be in order to set forth in some detail the

OBJECTS OF THE SOCIETY.

I. To promote the scientific study of alcohol and other narcotics, particularly the etiological, physiological, therapeutical, and medico-legal relations, and also the sociological and clinical aspects of this subject.

II. To compile and make available for others the studies of the investigators and the clinical observations of the physicians of all countries so far as they concern the relation of narcotics to man.

III. To gather and formulate all the facts of the disease of inebriety and other forms of narcomania, and point out the means of cure and of prevention by various remedial and prophylactic forms of treatment.

IV. The spirit and purpose of this society is to study alcohol and other narcotics in all their relations to the human economy from a medical point of view, independent of all previous theories and conclusions.

Pursuant to one of the purposes of the society I shall mention briefly some of the more important recent researches and the conclusions to be derived from them.

What is, in my mind, the most important recent work in this field is that done by Reid Hunt in one of the experiment station laboratories, and under Government auspices. Doctor Hunt^a used rabbits and guinea pigs for his subjects, and his problem was to determine the influence of alcohol upon the defense of the organism against bacterial and other toxins. Throughout his extended and exhaustive research Doctor Hunt found uniformly that *the ingestion of even small doses of alcohol was followed by a marked decrease of the defense of the system against toxins*.

^a Hunt. See reference in address by Professor Hall, Atlantic City, June, 1907, in *Journal of Inebriety*, vol. xxx, No. 4, 1908.

Others have published similar conclusions, but they were based upon clinical observations in which many complicating factors were involved, or upon animal studies much less extensive and under less favorable conditions.

We may, therefore, accept Doctor Hunt's conclusions as final and their proof absolute.

The important research of Beebe,^a published in 1904, must be mentioned in this connection. He demonstrated that when alcohol is given in moderate amounts the excretion of uric acid and allied substances is notably increased. His interpretation of this was that, as the liver is the place where toxic substances are oxidized to protect the body from their action, the oxidation of alcohol in the liver interfered with this oxidation of other toxic substances, thus permitting them to escape, to be excreted unoxidized.

The influence of alcohol upon muscular work has often been tested, either upon individuals or upon groups of men.

Dr. A. F. Hellsten has added his research to a long list, and with the usual result.^b His observations were made upon himself, testing his own capacity for muscular work. After preparing his muscles by practice in lifting heavy weights (90 kilograms), using the Johnson ergograph, and extending his training over several months, until his maximum accomplishment for a certain work period had been clearly established, he began the ingestion of varying doses of alcohol, or of sugar, or of tea.

Doctor Hellsten found that the immediate effect of a drink of alcohol was—

an increase in the amount of work done in a given time. After twelve to forty minutes, however, there was a diminution which lasted two hours.

The total work capacity is especially lowered after large doses of alcohol.

Sugar had no immediate effect, but after thirty to forty minutes it began to raise the work capacity and produced a noticeable increase in the total work done.

Tea increased the work capacity slightly and for a short time only.

Another investigator, Dr. H. Frey,^c enters this field for a second time, and as a result of an extended series of observations reiterates the general conclusions reached in his earlier experiments. In his paper on "Alcohol and muscle fatigue" he says:

Alcohol acts upon the unfatigued muscle to its disadvantage in that it lowers the maximum work capacity.

The work "appears lightened for a time, because *the alcohol diminishes the feeling of fatigue.*"

A small dose of alcohol taken after the muscles are already fatigued had the effect of "*increasing the work partly through increased height of contraction and partly through increased endurance.*"

This last result is in harmony with other work in this field and is easily explicable: By giving the alcohol after the muscle was fatigued and the contractions were decreased in height and the limit of work approached, the alcohol had the anæsthetic effect of "*diminishing*

^a Beebe: "The effect of alcohol on the excretion of uric acid in man." American Journal of Physiology, XII, p. 13.

^b Published in the Skandin. Arch. f. Physiol., XVI, S. 139, under the title "Ueber den Einfluss Alkohol, Zucker u. Thee auf die Leistungsfähigkeit des Muskels."

^c H. Frey, "Alkohol und Muskelermüdung," Leipzig und Wien, S. 62.

the feeling of fatigue," and because of this diminished feeling of fatigue the muscle would go on as if not fatigued for a short time, regaining for a time the height of contraction of the unfatigued or of the less fatigued muscle. Inasmuch as this drug effect is obtained just at the end of the work period, the total work accomplished for the period would naturally be above the average.

Doctor Frey does not report the condition of the subject after the first—excitation—period had passed. Nor does he report the influence of such a drug effect upon subsequent work periods as to total work done.

It is a well-known law of physiology that *anything*—excitement, exultation, hope of victory, fear of disaster, stimulus of martial music, etc., or drug stimulations, or anæsthesia—which *diverts one's attention from or allays one's consciousness of the discomfort or pain of fatigue will result in an increase of work capacity at the time of the influence.*

It follows naturally that if the influence referred to is brought to bear at or near the end of a usual work period there ensues a new lease of work capacity and the total accomplished during the work period may be notably increased. *But a reaction follows in which the work capacity is proportionately diminished.*

So we recognize as a law of physiology the following: *Any work, over and above the normal work capacity, done under the influence of any agent which diverts attention from or allays consciousness of fatigue acts as an overload or an overdraft upon the normal working capacity, which overdraft will make itself manifest sooner or later in a lessened capacity for work commensurate with the overdraft.*

Athletic trainers and coaches, army officers, teamsters, and industrial workers are acquainted with this inexorable law of work.

In the light of this law, Frey's results are of especial interest.

If we were looking for a reason for this phenomenon, so far as it concerns alcohol, such reason is, in part at least, furnished by F. Margnon,^a who made a study of the muscles of a dog put into $\frac{1}{100}$ NaF solution and placed in an incubator. A study of the products of chemical transformation under these conditions revealed the formation of acetone, acetic acid, alcohol, carbon dioxide gas, and water, in a step-by-step oxidation, the process being something like the following:

- (1) Acetone $[\text{CH}_3-\text{CO}-\text{CH}_3]+2\text{O}_2=\text{CO}_2+\text{H}_2\text{O}+\text{acetic acid } [\text{CH}_3-\text{COOH}].$
- (2) Acetic acid $[2\text{CH}_3-\text{COOH}]+\text{O}_2=2\text{CO}_2+\text{H}_2\text{O}+\text{alcohol } [\text{CH}_3-\text{CH}_2\text{OH}].$
- (3) Alcohol $[\text{CH}_3-\text{CH}_2\text{OH}]+3\text{O}_2=\text{carbon dioxide } [2\text{CO}_2]+\text{water } [3\text{H}_2\text{O}].$
- (4) Carbon dioxide and water being final or end products and ready for excretion.

Several other investigators have found alcohol in muscle tissue, so that it may be accepted as a positively demonstrated fact that alcohol may be found as one of the mid-products of tissue and cell catabolism (oxidation).

This fact has not been understood. There have been several interpretations of it. Here is one: "Alcohol is found in normal tissue. Being a normal constituent of healthy tissue, it is a proper substance to ingest." The writer has heard the above presented seriously by a scientific man in a discussion of the physiological effects of alcohol.

^a F. Margnon, "Production d'alcool et d'acetone par les muscles." *Comptes rendus CXLII*, 16, p. 1124.

The writer would reply to that course of reasoning as follows: "Uric acid is found in normal tissue. Being a normal constituent of healthy tissue, it is a proper substance to ingest."

When applied to uric acid the course of reasoning above seems absurd. Even the layman detects at once the fallacy and replies: "Uric acid is a waste product. Its presence in the tissues is no evidence that it is a proper substance to introduce into the tissues. When it appears in the tissues it is evidently on its way to be excreted. The introduction of more uric acid would be likely to embarrass or overtax the organs employed in getting rid of the uric acid produced in the tissues."

Such a course of reasoning is absolutely sound concerning this substance and dozens of others.

The detection of alcohol among the mid-products of tissue oxidation is no more proof that it is a proper substance to introduce into the dietary in beverages than the discovery of urea, uric acid, the xanthin bodies, glycocoll, acetic acid, leucin, tyrosin, etc., in the tissues is proof that they are proper substances to put into food or drink.

To sum up the results of the laboratory researches of the last three years one may say that as the evidence accumulates it makes positive the following facts:

- (1) Alcohol is a waste product of tissue metabolism.
- (2) Alcohol produces a toxic effect on living substance.
- (3) Alcohol in common with other toxic substances is oxidized in the body.
- (4) This oxidation is a *means of defense*, as the products are far less injurious than the alcohol.
- (5) Because of this defensive oxidation of alcohol, which takes place largely in the liver, the ingestion of more than a slight amount of that substance makes the body more liable to other toxic invasion.
- (6) Alcohol can not in the nature of the case be considered a food.
- (7) Alcohol decreases the efficiency of muscle, glands, and nervous system.
- (8) Alcohol is a narcotic in its drug action.
- (9) Alcohol given in minute quantities to lower animals seriously impairs fecundity; it leads to race suicide.

WATER, ALCOHOL, AND NEUROPATHY IN MAN.

By Dr. C. H. HUGHES, *St. Louis, Mo.*,

Editor of the Alienist and Neurologist, honorary member British Medical Psychological Association; also of the Russian Psychiatric Society, etc.

In the human organism as in the social life of man the enemy of alcohol and its potable combinations is water (H_2O).

Alcoholic mixtures therewith are more or less hurtful or harmless according to the relative admixtures of the beverage with this H_2O in the drink.

It is because of the strong affinity of alcohol for the fluids of the tissues, all the tissues of all the human organism being in great part water, the blood vessels and the stomach containing most, ordinarily, and the bones the least water, that it does its greatest harm to vital function and life. The cells and the nerves are literally bathed in serum, and this is water and salts for nutrition and support.

And this is what alcohol takes from the tissues, unless they are superabundantly fortified by exceptionally resisting nature. Alcohol acts like Metchnikoff's neuronophages, that first suck the nerve elements dry and open the way for their subsequent devourment.

Alcoholic compounds with water taken into and coursing through the organism so impresses the neurones of the brain and spinal cord and the cells of the viscera as to modify them more or less markedly according to cell and molecular resistance, thus causing the morbid influences called alcoholic toxicity (toxemia, neurotoxic, viscerotoxic, etc.). Alcohol's poisonous power begins with the chyme and chyle and ends in various degrees of paresis, paralysis, etc., of function, varying with the quantity, quality of food and water admixture, and the inherent metabolic and nerve-center power of the resistance by the organism from responsive temporary hypernormal excitation to positive paralysis under alcoholic impression.

Psychic center aptitudes to act wrongly under alcohol's power to rob the neurones of the nerve centers of their sustaining cerebro-spinal fluid varies from stimulated loquacity and imagination to helpless somnolency, positive delirium, mania, coma, paralysis, and somatic death. This robbing of the peripheral nervous system of its water of nutrition and functional support causes the phenomena of neuritis, multiple alcoholic neuritis, and renders the nerves, as takes place with the central neurones, defenseless to the direct destructive power of alcohol. First, function fails under water abstraction from these and the other tissues, then direct alcoholic destruction of tissue. And this is the manner in which it acts upon all the organs. First, by absorbing the water of the tissues, and next it makes its direct destructive assault on the vital organs and function.

It is thus that the light wines and beers are less harmful than the higher proof drinks. But no physiologist has yet demonstrated the full extent of the harmfulness, even in its more diluted forms, of alcohol as a constituent of the blood or cerebro-spinal fluid, taken regularly as a beverage. Alcohol is the protector of the dead, but not of living tissue. Its best place is in the dead house and the pathological laboratory, where brains and other organs are to be saved from microbic invasion, but not where living functioning viscera are yet in service.

Its transient and temporary therapeutic employment under certain exceptional states of extreme vital depression, if thoroughly chaperoned through the system with an abundance of aqueous or lactic admixtures and rightly responsive nutrition as malted or peptonized milk medicinally regulated by the scientific physician, bearing its damaging affinity for the watery constituents of the vital tissues in view, but it is not safe for a common beverage in any of its present commercial forms, nor for ordinary prescription.

It is a stealthy chemical robber, if admitted into the human system, a thief of the vitality of the tissues, especially of the psychic neurones and of the highest centers of organic life. To be longer deceived by it is not wise, for its promises of strength are mocking lies. Its semblance of power are simply nerve center disturbances that end in ultimate weakness and destruction. The sting of the adder is in its poisonous trail through the organism unless we extract its sting, when we employ it, by completely supporting the tissues against its depredations in the manner indicated. This serpent of the still can only be successfully fought in the system as in society by a temperate abstinence and plenty of water. It is the greatest of hydrophiles among beverages.

It persists in its attacks on the tissues until they have no water of life in them, and if we do not guard them well it destroys their vital power. And so it robs the brain of its normal functioning capacity, impairing it in mental and psycho-motor and moral capabilities.

Thus far has science tracked it and proven its crime against the organism—its enmity against normal nature in blood and every viscus, including most of all the brain—why then should clear-eyed science look with complacency upon the popular use of this destructive beverage—why, as physicians, prescribe it for drink? Why omit admonitions against this enemy which man so often takes “in at his mouth to steal away his brains?”

One of the chief effects of alcohol being a drought of all tissue territory of the human organism, as shown not only in experimental and post-mortem evidence, but in the intense, overmastering thirst for water or milk after an alcoholic debauch, we find, as might have been expected without further proof, the shriveling of the cells of organic building and function. As the inferior animals may be stunted in development by it, so are organs arrested in growth and damaged in structure and function by it. These ravages are too familiar to physicians accustomed to study the effects of alcohol on the cadaver to need recounting. The indurative changes in organs made possible by the withdrawal of the physiological guardianship of the water of the tissues are shown, not only in the direct induration, as of hepatic and arterio sclerosis, but in the many septic destructive processes where toxic germs get into vital points, because of denudation, become

the true water of life, not the spurious *aqua vitæ* of our mistaken ancestors, is not on guard at the doorways of tissue and visceral life. Such are the gastric and gastro-intestinal, hepatic, renal, and other ulceration enemies of organic life and function—for it is when the phagocytes are not numerous enough or vigorous enough and the metabolic powers are below par and the neurenogen functions are not what they ought to be for lack of the water of proper organization which alcohol takes away, that the disease-engendering enemies of normal protective vital movement get in to harm and destroy. The brain needs water, nutrition, and rest more and alcohol less for its right adjustment to environment and longevity in our civilization.

A delirium-tremens patient of mine who lived under the delusion that from his repeated recoveries that he would always get well, finally became alarmed when the eighteenth or nineteenth attack kept him in bed and house longer than usual and more shattered in brain and general nervous system, finally decided, in the next attack and but one preceding his death, that he would call the priest, for he was a devout Catholic when alcohol brought him prostrate to bed. At this one of my visits the priest came out smiling, and as he would not enlighten me I asked the patient what he said. He answered that when the father asked him to proceed with his confession he had said to him that he could not recall all he had done of evil in the world since his last confession and was afraid he would die before he got through if he attempted it. So he said, "Father, I have never stolen anything or murdered or gone away with another man's wife, but whatever else there is of evil against me I guess I am guilty."

But alcohol has done all of this in the world and more. It has done the things in addition that this poor inebriate escaped. He died in the next following seizure.

In England in a controversy now going on between the brewers and scientific experts this question of the saving relation in the human system of water to alcoholization is inadvertently recognized by the brewery interest through their representative, Mr. Edwyn Barclay, in the following questions:

What is the general effect on the human system of a beverage containing a very low percentage of alcohol combined with a large proportion of easily assimilable carbohydrates and proteins? What is the specific effect of such diluted alcohol so blended with neutral matter and in such connection? ^a

And we have endeavored to partly answer this question without prejudice. But there is one not precisely known factor, yet a significant one, in this problem, and that is the psychopathic diathesis which responds so differently and so harmfully to the fatal sanguine touch of alcoholized blood even when impressed in slight proportions upon the psychic centers of the brain.

^a The Hospital, February 27, 1909, p. 574.

PAPERS PRESENTING SPECIAL CAUSES AND CONDI-
TIONS FAVORABLE TO THE GROWTH OF
ALCOHOLIC INEBRIETY.

TOXINS AS ACTIVE CAUSES OF INEBRIETY.

By G. H. BENTON, M. D., *Chester, W. Va.*,
Superintendent, Sterling-Worth Sanitarium.

In pursuing the etiological factors of inebriety we have an extremely broad field to cover. While this paper is confined to the influence of toxins as an active cause of inebriety we will necessarily have to encroach slightly on other facts and factors, at least occasionally. I shall confine myself largely to the influence of autotoxiosis, especially to the endogeneous intoxications, and while also exogeneous intoxications enter into the etiology, still I am thoroughly convinced that they are of secondary importance.

Primarily we must first turn our attention to the inebriate, and for the purposes of this paper we may well divide them into three classes, and these three classes we will signify as inebriates from habit drinking, accidental inebriates, and neuropathic inebriates. Now, a word of explanation in reference to these three classes: By habit drinking I mean an individual apparently free from hereditary neurosis, one who indulges mildly or excessively in alcoholic intoxications and who has acute or subacute alcoholism, but who does not exhibit these neuropathic degenerations existing before addiction which produce an insatiable desire to alcoholic narcosis. These patients are frequently periodical "spreers," but their symptoms are specifically of a diametrical contrast to the dyspomaniac, or more properly alcomaniac. These patients, as they will explain to you, have the power, if alcoholic drinks are placed before them, to take them or let them alone, and while they will most always take them, yet refusal is possible within their physical power.

By "accidental inebriates" I want to signalize a class of individuals who fall victims to excessive alcoholic use as it appears through accidental means—environment, education, in either early or late life, and social indulgences—who begin the use of alcohol moderately as beer, whisky, wines, etc., and also the habitual patent medicine users, and who may or may not even in their own minds question the possible results seriously, but who have, nevertheless, apparently good constitutions, good physiques, but in whose condition there can be demonstrated at least slight neuropathogenesis. It is not necessarily shown whether this neuronc degeneration may be congenital or acquired, as apparently healthy individuals early in life do not come under the close scrutiny of a careful, observing physician detailing the actual physical status. Mild, inherent, or acquired pathogenesis may either be unnoticed or overlooked in fairly healthy individuals who apply for minor incidental treatment.

This second class of inebriates who, when they have reached the stage of alarming alcoholic excess, and even after it is somewhat prolonged, may still be curable, debarring, of course, the influence of intercurrent organic lesions which obtain in such cases. The first variety, the habit drinkers, are almost invariably readily curable, and are a class of people who very seldom relapse, while you may expect the possibility of relapse in the second class.

Now, in the third class, the alco-maniacs, we have to deal with the hardest form of inebriety and a form dependent upon the actual subjective and many times varied neurosis. This class is recruited from the congenital neurotics, I think, without exception. They are augmented from the geniuses, the precocious, the progressive, and the aggressive members of society, who frequently possess an especially acute mentality, and are sometimes only term inebriates. I have now in my mind a case whose period of inebriety appeared about once in seven years and lasted from six weeks to three months, and another who had but three attacks during life; the first attack lasted nearly three years, an intermission of twenty-one years between the first and second attacks, and finally succumbing during the third attack.

Now, in the study of autotoxycosis and its influence on inebriety it becomes simply a matter of physical and neuro degeneration and the reaction is apparent through the central nervous system; consequently my investigations of the influence of autotoxycosis on nervous and mental diseases within the past year have convinced me, as I find that many authorities have been convinced previously, that a careful study of inebriety discloses the fact of a disordered nervous system in many more cases than we find either environment, education, or viciousness; consequently, when we have considered the effect of autotoxycosis on the nervous system and on mental diseases we are in a position to easily graft on the result, in hundreds of cases, namely, inebriety. The inebriate, when he has reached this stage, namely, uncontrollable desire for alcoholic narcosis, is not a normal individual, functional or organic degenerations are demonstrable, which affect especially, both directly and indirectly, the central nervous system. These degenerations and functional changes do not entirely come from alcohol alone; many of them existed during longer or shorter intervals prior to the use of alcohol and are dependent upon both hereditary and acquired neurosis, all of which are aggravated and prolonged by the use of alcohol.

Starting an apparently normal individual in life, with faulty habits of mastication, lack of rational exercise, an unproportionate amount of mental work, an irrational amount of sleep, and the other hundred and one incidents of faulty living, which are as common as sunshine, and we can easily realize how soon he ceases to be a normal individual while long before he realizes it or can be impressed with the fact he has generated within his system functional or perhaps organic lesions, the progress of which soon demands a narcotic which will produce relief from the continual irritation of neuro-toxicosis. This is the course of the individual who starts life with seemingly normal resistance; but just conceive for one moment the condition of the defective individual who begins life with unequal advantages, the number whose defense lines, weakened from congenital neuroses, being submitted to the same or similar conditions which continually surround all of us, and the conflagration is only more rapid.

Now, we have an intermediate class who present no congenital defects but who easily succumb to the influence of autotoxiosis, which eventually produces an inebriate purely through degenerations of the physical being and through the central nervous system; therefore, let us turn our attention to the effects of autotoxiosis on nervous and mental conditions. In autotoxiosis we may include all the endogenous intoxications; first of metabolic order, under which we recognize a condition of perversion of the normal physiological function produced by either an excess or deficiency of the normal metabolic constituents, and these constituents not only include the primary materials of nutrition and metabolism but also the physiological fluids and secretions associated with and elaborated in the process of anabolism and katabolism. These intoxications of perverted metabolism induce a large range of attitudes within the physical economy more or less responsible, both primarily and secondarily, for the larger range of physical symptoms and disease from which humanity suffers, exclusive, of course, of external accidents and some surgical maladies, but nevertheless complicating many times the latter to a serious degree; secondarily and also primarily by its influence in reducing normal vitality and weakening or destroying the normal defense lines of resistance.

Endogenous metabolic intoxications embrace numerous subdivisions to which we may well direct our attention, the primary function of which is oxidation, which may in turn be divided into insufficiency of oxygen, suboxidation, and superoxidation.

Distoxication and overexertion also follow, while retention intoxications cover the toxemias produced by retention of bile, perspiration, fæces, carbon dioxide, and the suppression of urine.

Intoxications from salts, acids, alkalies, and acidosis.

Intoxications from fevers, infection, and neoplasms.

Intoxications due to the perversions of protein metabolism, giving expressions in cystinuria, alkaptonuria, and uræmia.

The perverted nuclein metabolisms producing gout and oxyluria.

The perverted metabolisms of the carbohydrate group:

Metabolism of fats: Acetone complex (glycosuria and diabetes).

Diseases of special organs: Thyroid, adrenal, pituitary bodies, pancreas, liver, etc.

And the second order, parasitic intoxications, embracing both systemic and alimentary intoxications; the former covering infectious diseases and the latter due to bacterial processes and also to the higher parasites as vermes. This second order of intoxications or parasitic intoxications is endogenous, exhibiting intimate relations to and with metabolic intoxications, and evidence is at hand showing that it is proper to assume that in the larger percentage of the infectious diseases, the major part of the deleterious results which accrue is resultant from the autotoxiosis secondary to the metabolism of the bacteria and does not necessarily bear any relation to the specific poison of the particular micro-organism representing the infection. Since in many instances no other intoxication is apparent, we are led to believe that some micro-organisms are solely harmful through exciting an auto-intoxication which is of the nature of accelerations or exaggerations of normal processes, katabolism, oxidation, and cystolysis. Exaggerations of katabolism and oxidation which are concurrent in the infectious diseases express a distortion of metabolic balance, with

which you are familiar; also the acceleration of cystolysis as commonly observed in infectious diseases.

It is impossible and unnecessary in a paper of this length to go into the technic of the processes producing or affecting the large range of auto-intoxications which are daily expanding their virulence on the anatomical constituents of the physical economy, producing, or at least influencing, morbid pathological changes or perverting normal physical functions, resulting in varied degrees of invalidism, from the slight acute indispositions to the profound organic changes, yet your daily observation must confirm the results of the careful study of our pathologists, biologists, and chemists who are daily seeking and demonstrating the processes through which these auto-intoxications are generated and elaborated within the system. And while much confusion still exists as to exact processes of production and actual extent of damages incurred within and upon the physical entity and its functions, yet sufficient evidence has accumulated and demonstrations are numerous within our daily observations to prove the dangerous aspect of autotoxiosis, and yet I believe they are continually underestimated or their relative importance is overlooked in calculating the etiology of diseased conditions present, and especially in relation to gastrointestinal autotoxiosis.

The trend of modern living suggests the most extensive possibilities in producing gastrointestinal autotoxiosis by the rapidity with which we eat without proper mastication of our food, thereby consuming larger quantities of food than the system demands or can use properly; in the selecting of improper food, either of kind or quantity or quality, and irrational preparation of same; perversions of appetite; the attempt to digest large meals when the brain is actively engaged in study, business cares, mental anguish, or worry. Good digestion requires the termination of the excess of blood to the stomach and intestines; active cerebration also requires the termination of the blood to the brain; and as both can not be adequately supplied at the same time, one or the other process must suffer some depression, which is usually first expressed actually as a disordered digestion, and finally through the nervous system—toxins formed primarily and secondarily within the gastrointestinal tract and elaborated through the system. The nervous system, both peripheral and central, will show the results, which may express themselves in every degree of divergence from mild acute functional disturbances to chronic organic lesions.

I have referred to me frequently nervous and mild mental cases and functional diversions whose etiology express primary autotoxiosis of gastro-intestinal origin without other complications, and who clear up readily through eliminatory processes and the correction of faulty habits upon which the primary trouble existed—cases who do not relapse excepting through their own indiscretions of diet, etc. However, the effect of autotoxiosis through bad hygiene and diet, faulty mastication, or other causes, though minimal in amount in each instance, but more or less continual, will show marked degrees of first psychological diversion, then physical perversion, and eventually pathological entities, which leaves its impact on the nervous system.

Demonstrations of the effect of autotoxiosis on the nervous system are observed in varied degrees, as expressed in the following

conditions: Migraine, neuritis, epilepsy, myasthenia, melancholia, dementia, paralytica, periodiac, family paralysis, constipation, nervous dyspepsia, tetany, pain, vomiting, diarrhea, fever, etc.

Stuertz reports a severe case of autointoxication of intestinal origin, with loss of consciousness, dilatation of pupils, clonic convulsions, pupils insensible to light, slight trismus, increase of skin and tendon reflexes, rise of temperature, slight albuminuria, and a large amount of indican, but with absence of aceton or diacetic acid; after entrance to the hospital the pulse fell to 52 and eventually to 42. This bradycardia lasted for twelve days. The treatment, which consisted of calomel and colonic flushings, was successful.

Dr. C. A. Herter, New York, through his careful clinical experience, backed by equally careful and persistent chemical and bacteriological research, has recently published a monograph under the title of "Infantilism from chronic intestinal infection," and cites five cases—children whose growth and development was checked by intestinal autotoxiosis—in which he demonstrates an intolerance of carbohydrates, and his study of the fecal flora shows that the normal gram-negative bacilli and cocci are replaced by gram-positive bacilli, one of which, bacilli infantilis, is regarded as having an etiological relation to disease. The process shows considerable loss of fat in the stool, which, combined with the restriction of carbohydrates, results in a condition of undernutrition. This accounts for the lack of development of the tissues in general, and again the diminished absorption of fats has a further detrimental aspect by withdrawing the alkaline substances, calcium and magnesium, in the formation of soaps. Thus deprived of its mineral constituents, the skeleton fails to develop.

This condition is found to be chronic, the bacilli have firmly established themselves by long habitation, having first become implanted during acute or subacute gastroenteritis in early infancy.

Autotoxiosis of gastrointestinal origin is undoubtedly of the most common occurrence, and it is more than probable that no individual ever existed without incurring one or more attacks, while the rule is that the larger majority of individuals suffer more or less continually with recurrent attacks, and many of them with such frequent recurrences as to express a condition of continual toxicosis which, perhaps, began with transitory or acute auto-intoxications, but in the wake of its rapid repetition and continuance induced the other metabolic perversions including any or many of the endogenous intoxications, with especial predilection for one or more of the retention intoxications. Representing a class of cases who consult their physician with no special organic lesions but whose physical functions are perverted and distorted that it sometimes is puzzling to decide where to begin to establish normal physical function. This class of cases, which present themselves in a condition of a more or less chronic toxicosis, also represent varied conditions of functional or even the more grave forms of nervous manifestations or even actual phychosis, while the cases who have begun thus and failed either partially or fully to follow the advice of their physician as to prophylaxis and treatment, and who have developed organic lesions either of the central or peripheral nervous system, or both, usually allow themselves to succumb to any intrinsic or extrinsic intoxications which present themselves, either intrinsic auto-intoxications over which they have no further control or from extrinsic intoxica-

tions under the guise of medication through the hope of relief from the distressing symptoms of their maladies until they eventually produce drug neurosis in the varied degrees of inebriety.

Autotoxicosis produces marked degrees of effects on the peripheral nerves, both in their trunks and endings in the muscles, but in a much lesser degree than is witnessed in the nerve centers owing to the more intense metabolism through the freer vascular supply, the nerve centers are seats of much greater activity and are exposed thereby to the injurious influences of effete material, which may be circulating in the blood current. The ratio of the difference of this effect is proposed as one to five.

The results recognized from the effects of autotoxicosis upon the nervous system may be both mediate and immediate, both trophic and toxic, and just here I wish to call your special attention to more recent investigations by our leading neurologists in reference to the relationship of arterio-sclerosis and diseases of the nervous system and also some references to the recent studies on the influence of circulating toxins on the production of arterio-sclerosis. The older theory that arterio-sclerosis was incumbent on hypertention is gradually being abandoned as the cause, although it may or may not be concomitant with the diseased condition of the arteries.

The present acceptance of the disease resulting from the investigations of Van Noorder, Klemperer, and others, demonstrates that the primary irritation is due to toxic materials circulating in the blood.

It has long been apparent that alcohol, rheumatism, malaria, typhoid fever, and such diseases have been productive of arterio-sclerosis, and omitting all the long explanations demonstrating the immediate process producing this condition, which are conclusive, I will refer only to one, the production of arterio-sclerosis by the use of adrenalin chloride as demonstrated in experiments upon rabbits and other animals, conducted in such a manner as to show that the changes in the blood vessels were due to the toxic principle rather than from hypertention. The experiments of T. Mironescu (3) *Therapeutische Monatshefte*, January, 1906, were conducted on rabbits, in which he neutralized the constrictor action of adrenalin by a simultaneous administration of euphthalmin, there was produced thereby calcification of the aorta from which was concluded that the degenerative changes were due to direct toxic action of the adrenalin on the vessel walls, the variations of blood pressure being only subsidiary.

In the present era arterio-sclerosis is recognized as much more common and extensive than formerly conceived or at least taught. From our twentieth century fury of high speed tension employed in modern business life, and a large range of other contributing causes, there may exist much more extensive lesions of this kind, and again with our modern technic and instruments of precision we may be more capable of early and frequent recognition. Then, again, the hereditary factor may be traced, due perhaps to inherited perverted structures of the blood vessels, which render them more susceptible to accident and injury. At any rate, it is a diseased condition which we may recognize much more frequently, also its results in the influence and production of nervous and mental diseases, the importance of which has steadily been growing in the minds of neurologists until it appears that in the diagnosis, prognosis, and treatment of nearly

every chronic nervous disease, either functional or organic, the question of the existence of arterio-sclerosis must be dealt with.

The position arterio-sclerosis formerly occupied in relation to senility and old age, which has been assigned it by our predecessors, has advanced during the present generation to manifestations of the commonest sequence of a strenuous, disordered, irrational mode of our modern life.

In conclusion let me refer to the studies of Dr. J. Collins (New York Medical Journal, June 9, 16, 23, 1906) of the relationship of arterio-sclerosis and diseases of the nervous system based on 800 cases in which the diagnosis of arterio-sclerosis was definitely made, taken from the records of 10,000 consecutive cases of nervous disease, in which he says arterio-sclerosis may cause (1) diseases of the nervous system that are well-defined clinical entities, and are therefore described as definite diseases; (2) it may superimpose definite or indefinite symptoms upon any disease, incidentally altering the clinical feature of the disease; (3) it may give rise to symptoms which are so disparate that it is difficult to group them under any one heading, hence they are therefore often considered to be functional, neurasthenic, or hysterical; and (4) it may cause symptoms almost identical with those of well-known diseases. The desirability of early diagnosis in arterio-sclerosis is the greater because of what would seem to be the fact that in its incipency the pathological processes may be checked, but the difficulty of early diagnosis may be very great and, regrettably, the diagnosis must still often be empirical, vessels susceptible of examination, manual or instrumental, may be free from perceivable sclerosis while others inaccessible are well advanced in the process which is productive of symptoms.

In the 800 cases above referred to there were 206 patients suffering from disorders of the nervous system, directly attributable to this cause, in which the symptoms varied from slight vertigo to the most profound dementia, and between these two extremes one might find almost any kind of subjective and objective disturbance—paralysis, aphasia, hemianopsia, emotional upheavals, bulbar, and spinal symptoms of every sort; and, further, Collins has observed many times a clinical form of cerebral arterio-sclerosis, heretofore inadequately described, and has studied the lesions after death. A fugitive occipital headache, slight dizziness, feeling of insecurity of station, and impaired snap and vitality go to make up the picture. Sometimes there are early emotional manifestations—attacks of meaningless laughter, less often of crying, not coming on spasmodically, as in multiple sclerosis and old apoplectic cases, but, nevertheless, like them, by reason of having no attributable cause and being without emotional concomitant.

The most striking feature of the disease is the alteration of the patient's appearance. The individual becomes transformed from a person expressing grace in movement and relaxation in repose into an immobile, inanimate replica of the normal person.

The immobilization gives a more or less characteristic gait and attitude, which is remarkable; the stride is short, feet widely separated, and often the patient runs better than he walks. The knee jerk is usually lively, and in some cases Babinski's sign is present.

Death may come from syncope, intercranial hemorrhage, or from trifling intercurrent disease. Pathological examination may show

the brain normal or shrunken. The vessels at the base may be atheromatous or not, and sometimes the only striking alterations are in the middle cerebral arteries and their branches. Collins had 15 cases and 5 autopsies.

The chief manifestations that cerebral arterio-sclerosis produce aside from the symptom-complex above described are: (1) Insomnia and dyspnoea; (2) headache and cephalic paresthesia; (3) vertigo; (4) brain tumor symptom-complex; (5) neuresthenic symptom-complex; (6) epilepsy, focal and general; (7) amnesia and dementia; and (8) apoplectic symptoms.

Now, realizing the extent and possible range of physiological perversion and neurological degenerations arising from the more or less chronic course of our too habitual autotoxycosis, and our knowledge of the etiology and pathogenesis of inebriety, it is impossible to the fully demonstrated fact of cause and effect, between toxins and inebriety. The neurotic, whether the neurosis be of hereditary origin or induced, is compelled to perform his daily duties under the stress of continual nervous irritation, and he soon learns that alcohol or the other narcotic drugs through their paralyzing effect produces a feeling of comfort, never realizing, however, the danger of the remedy; his irritation is so uncomfortable and so continual that he even is induced to run exceptional risks to secure that desired relief, believing fully that he is an exception to the usual individual and can stand the test, or many more times has no conception whatever of the danger of the remedy, and, further, is unable to picture himself as a possible inebriate until it is too late; once started the conflagration proceeds in exact proportion to the kind of fuel which has been prepared for it through autotoxycosis mainly.

ALCOHOL AS AN ADULTERANT IN FOODS AND DRUGS.

By Prof. H. W. WILEY,

Chemist to Government Department of Agriculture, Washington, D. C.

Fortunately alcohol is not used very extensively as an adulterant in foods aside from its presence in alcoholic beverages. It is true that occasionally makers of confectionery have placed alcohol in confections, but this is positively forbidden at the present time by the food and drugs act, which makes it a criminal offense to put alcohol in any form into confections. Alcohol instead of brandy, unfortunately, is sometimes used in preserving peaches under the name of "branded peaches," but this I believe is not a very common offense.

I wish to speak to you chiefly, however, respecting the use of alcohol as an adulterant in beverages containing alcohol. There are three great classes of alcoholic beverages. First, fermented beverages, such as wine, beer, and cider; second, distilled beverages, such as whisky, brandy, and rum; and third, mixed drinks of all kinds containing alcohol as one of their constituents. What I have to say to-day relates particularly to these mixed drinks. It is well known that alcohol per se is a poisonous substance, and hence produces intoxication. I may say that no refined taste ever drinks alcohol as a beverage. You can not find it sold over the bars in any saloon, perhaps, in this city. Even those who are addicted to the alcohol habit prefer a beverage containing alcohol as one of its ingredients to the pure article. There are some drinkers of alcohol, however, who like to have it straight—as, for instance, those who drink vodka in Russia, and other drinkers of pure alcohol in northern Europe. The habit has not extended, however, to this country except as it has been brought in by some of the emigrants from northern Europe. The great bane in the use of alcoholic stimulants to-day is in the mixed drinks, such as cocktails, absinthes, and other mixed articles. It is in this form that it produces its most deadly effects.

I shall speak to you particularly about absinthe, because not only does it contain alcohol pure and simple, but also a number of extracts from herbs which are of a highly injurious character. The absinthe plant itself furnishes the extract which gives the beverage its name, but in addition to absinthe, hyssop, fennel, poisonous sage, and some other plants are used. This group of bodies used in absinthe produces to those who are addicted to their use convulsions of an epileptiform character. This is not a true epilepsy but an epileptiform kind of convulsion, resembling that of true epilepsy, but of course of a transient character, passing off as the drug spends its power. Taken singly or together they are bad enough, but when mixed with alcohol

their effect is more pronounced. The sale and manufacture of absinthe have been forbidden in Belgium and Switzerland. In the latter country prohibition has not yet gone into effect, but has been voted. In France the effects of the use of absinthe have been studied by learned commissions for a number of years, and as a result of these studies the French Government has strictly regulated the manufacture and sale of absinthe in that country, and there is a serious contemplation of the desirability of forbidding it altogether. Fortunately, the use of absinthe has not spread to any very great extent in this country, and let us hope that steps may be taken to prevent any additional use of it, or even that it may be stopped altogether. Under the food and drugs act it appears to me that the importation of absinthe from a foreign country may be prohibited, and I am at work at the present time on a report, to be presented to the Secretary of Agriculture, in which I shall base my recommendations for prohibition, just as smoking opium was prohibited under the food and drugs act. This is one of a very bad type of drinks of this kind which should be restricted or prohibited.

There are other drinks which also demand attention as well as alcohol, and among those I may mention the secret use of caffeine. You will find in the report of the President's home commission almost one hundred preparations containing caffeine which are designed to be sold at soda fountains. Thus it often happens that parents who do not permit their children to use coffee and tea in the home are allowing them to use caffeine in its most injurious form at the drug stores. In my opinion the use of caffeine in so-called "soft drinks" should be prohibited because of its highly injurious effect, especially upon the organism of the child. This is a question, however, which I shall leave to be discussed by one of my assistants, Doctor Kebler, who has made a special investigation of this matter.

The evils which come from the secret use of drugs are well known. Some of them are bad enough when they are used openly, and they are all reprehensible when administered without the knowledge of the victim. In my opinion the greater part of the evils against which the propaganda of prohibition is waging war would be entirely eliminated by the prohibition of the use of alcohol in its pure form in any kind of a drink or mixture, and if alcoholic liquors are to be used at all they should be confined to those pure, old, and mellow, in which nature modifies the injurious properties of the alcohol by many forms of combination. It should be the part of all good citizens to aid at least in the war against alcohol used as an adulterant in foods and drinks.

ALCOHOL AND ITS INFLUENCE ON PULMONARY TUBERCULOSIS.

By Dr. H. J. ACHARD, *Asheville, N. C.*

It is but natural that in a disease so widely distributed as is pulmonary tuberculosis, and so intimately connected with the social question, so called, in all its different view points, the attention of physicians, sanitarians, and sociologists alike should have been drawn to the interrelation of the disease with others, whose more or less serious effects on the body political require the careful attention and consideration of political economists and of public workers. One of the most fruitful sources of the social evil, to which the "white plague" contributes its full share, is undoubtedly the abuse of spirituous liquors or chronic alcoholism, and its connection with the causative factors of pulmonary consumption has been the subject of much discussion and experiment. I propose in the following pages to review the opinions held on the subject in times gone by, then to give the physiological data concerning the action of alcohol upon the organism, data upon which the right of the drug to be considered as a valuable therapeutic agent has wrongly been based, and finally to relate some of the experimental investigations which have been made with a view of elucidating and eventually settling the question at issue. It is of course impossible to consider the literature pertaining to the subject at all completely, nor is such a course necessary, since much has been told and retold, much is irrelevant, and, moreover, it can not be within the province of a journal article to repeat in detail the controversies and investigations which have led to the acceptance of a certain hypothesis or theory.

While the Ayur-Veda of Susruta,¹ the ancient medical codex of the Hindu, recommends alcohol in the treatment of consumption, declaring that distilled spirits remove consumption, it is silent on the question whether the abuse of alcohol contributes to the origin of the disease. Hippocrates² likewise does not enumerate alcoholism among the causes of consumption, but recommends the use of old, tart, red wine *in small amounts* to consumptives. Celsus,³ on the other hand, held that wine was harmful to those afflicted with the disease. Of the writers of the middle ages and of more modern times, most authorities acknowledge the injurious effect of excesses of every kind, especially those in *baccho et venere*, for the origin and in the course of phthisis. So includes Richard Morton,⁴ who may, after Sylvius, be called the first great "phthisiographer," the "excessive ingestion of wine and strong spirituous drinks" among the causes of "original pulmonary consumption," and is confirmed by Boerhaave.⁵ Didelot⁶ said in 1780 that phthisis, which was very frequent in the Vosges,

killed there many peasants addicted to the use of spirits, and de Brieude⁷ declared that drunkenness among the people of the Auvergne, and especially among the women, whose passion for wine and spirits he calls incredible, was one of the principal causes of consumption. Benjamin Rush,⁸ too, already in the first edition of his *Medical Inquiries* (1789) called attention to the increase of consumption in the United States, together with the increasing intemperance and sedentary modes of life. Wichelhausen,⁹ who carefully differentiates what he calls the "slimy" from the other forms of consumption (*phthisis pituitosa*) considered the immoderate use of heating drinks, especially wine and spirits, as one of the most frequent "occasional" or accidental causes of the disease (1806). He asserts that the many persons who succumb to the disease in the later years of life are commonly immoderate drinkers, and brings the fact that in early life more females than males die of the disease, while in later life the reverse is true, into relation to the abuse of spirituous drinks among men. Papavoine explained the unfavorable action of alcohol by the increasing debility of the system which it causes, and Schoenlein¹⁰ called it pernicious for the same reason. Sir James Clark¹¹ considered the abuse of spirituous liquors among the lower classes in England productive of consumption and other tuberculous diseases to an extent far beyond what is usually imagined.

Toward the middle of the last century, however, a different opinion began to make itself felt, and strangely enough it originated in our own country. Dr. J. B. S. Jackson¹² had rarely observed *phthisis* among drunkards; out of 35 alcoholics only 5 were found tuberculous on autopsy, and of these only 2 had died of *phthisis*. Doctor Peters¹³ had, in the bodies of nearly 70 persons dying suddenly or found dead in the streets and who had been known as alcoholics, detected not a single instance of actively softening tubercle, and only a few cases of chalky tubercle or cicatrices surrounded by little numerous tubercle. He inferred that alcoholism exerts a prophylactic influence against the formation of tubercle. Doctor Washington¹⁴ asserted by deductive reasoning that, since *phthisis* has its origin in deficient respiratory action, the use of alcohol will overcome the defect by causing a more rapid breathing. Kubik¹⁵ in Prag also failed to find tuberculosis in any of his autopsies on persons dead of *delirium tremens*. But it was especially due to Magnus Huss,¹⁶ whose work on *Alcoholismus Chronicus* (1849) made him an acknowledged authority on this disease, that a tendency declared itself to assume an actual antagonism between alcoholism and *phthisis*. Having found tubercle arrested in their development in autopsies on alcoholics, he attributed the result to the alcoholism and advocated on that account the use of alcohol in the treatment of consumption. By so doing he caused alcohol to become a popular remedy, and although physicians have long since been convinced of the fallacy of the prophylactic value of alcohol against consumption, and have come to learn that the drug is a two-edged sword and only to be used for clearly defined cases, the popular error is not, to this day, eradicated.

These erroneous ideas which, without sufficient scientific foundation, have invaded medical science were emphatically attacked and shown to be errors, in our own country, first by Dr. John Bell,¹⁷ of New York (1859). In his essay which received the prize of the Fiske fund from the Rhode Island Medical Society he found it

"difficult to imagine how so widespread a belief could have arisen from so few recorded facts." Two theories, he says, as to the causes of the deposition of tubercle in the lungs from each of which the utility of alcohol as a therapeutic agent has been inferred, have been extensively circulated in the medical journals. The first of these is a chemical one. It supposes that the tissues of the body, and particularly of the lungs, are too rapidly oxidized, and accordingly that alcohol, like cod-liver oil, might supply the fuel for this abnormal combustion, and thus prevent a continual waste if not supply material itself. The other theory is a mechanical one, and attributes the origin of tubercle to a deficient circulation of the blood, and a consequent retrograde metamorphosis of the tissues. In this hypothesis, too, alcohol is the remedy, by increasing the action of the heart. These theories have undoubtedly assisted in giving currency to the prevailing opinion, viz, that alcohol is favorable in phthisis and antagonistic to it.

From a careful and extensive statistical study, which we can not give here, even in abstract, it "seems almost conclusive that the use of alcohol not only has no power to defend those predisposed to phthisis from its attacks but would, with little doubt, change the predisposition into actual disease."

The work of Bell was confirmed by Dr. N. S. Davis¹⁸ in a report to the American Medical Association (1860). From careful notes on 210 cases of consumption he found that 68 had been habitual users of alcoholic liquors for from one to twelve years before their disease first manifested itself, though only 15 of these could be called "drunkards;" 91 had used such drinks occasionally, and 51 had abstained wholly. The average duration of the disease from its first signs to the fatal termination was in the three classes of patients nineteen, twenty-three, and twenty-five months, respectively. Doctor Davis claimed that the use of alcoholic beverages neither prevents the development of tuberculous phthisis, nor retards the rapidity of its progress. In fact, by impairing "metamorphosis" (metabolism) and elimination, it facilitates the development of tuberculous disease.

Needless to say, the conclusions promulgated by Bell and Davis were not at once accepted by physicians. Doctor Walshe,¹⁹ while refusing to pronounce a decided opinion on the influence of alcoholism, thinks that "publicans, who unquestionably as a class consume their own vendibles, are *ceteris paribus* less destroyed by phthisis than persons in various other walks of life." Leudet,²⁰ too, found among 295 drunkards only 37 cases of pulmonary tuberculosis, and held that abuse of alcohol does not hasten death from tuberculosis; in fact, he observed that in potators the disease took a more chronic course than in other persons, although on the other hand he acknowledged the deleterious action of alcohol in its causation of hepatic cirrhosis. Rose²¹ found frequently indurated tuberculous areas in the lung apices of alcoholics, and to a higher degree than miliary tubercle. Koranyi²² finally claimed that the ability of alcohol to influence directly the pathological process in the tuberculous lung can not be denied. This influence is, according to him, probably a connective tissue hyperplasia in the lungs. He was only recently confirmed by Hammer,²³ who concluded from the findings in three autopsies on phthisical potators, where enormous connective tissue thickening was found around the tuberculous foci, that alcohol

stimulates connective tissue proliferation, and that it thus may become a healing factor.

One of the foremost opponents of alcohol, since the reports of Bell and Davis, was Professor Lancereaux,²⁴ of Paris. The abuse of spirituous liquors, according to him, contributes greatly to the development of one of the most acute forms of phthisis, the acute miliary phthisis. He explained the undeniable influence of alcoholism upon the occurrence of tuberculous peritonitis by the irritation caused by alcohol through the portal vein in its entire territory, and considers this fact to be the probable reason of the great frequency of tuberculous peritonitis in persons over forty years of age. "Every physician," he exclaims, in his "*Leçon de clinique médicale*" (1879-1891), "who will take the trouble to follow up the cases of alcoholism, as I have done for a long time, will infallibly realize that the majority of these patients become consumptives." Spirituous drinks act, according to Lancereaux, in two ways, causing a malnutrition by diminishing the appetite, and a pulmonary irritation in the course of their elimination.

Hérard and Cornil,²⁵ in the first edition of their work on pulmonary phthisis, as well as in the second, published with the collaboration of Hanot, could not agree with Magnus Huss and Leudet regarding the antagonistic influence, if any, of alcohol; they collected histories of a number of consumptives in whom the disease evidently commenced after the immoderate use of alcoholic beverages. In several cases the course of the disease was rapid.

In the annual report of the Massachusetts State Board of Health (1873), Doctor Bowditch²⁶ gave the result of an inquiry made among 210 physicians regarding the predisposing action of alcohol to tuberculosis. Of the 210, 109 replied affirmatively, 47 negatively, and 13 were noncommittal.

Dr. Horace Dobell,²⁷ whose peculiar and withal ingenious ideas on the origin of tuberculous phthisis are well known, found a ready explanation, which fits beautifully into his etiological system of the disease. Attributing, as he does, tuberculosis to an insufficient action of the pancreas, the influence of alcohol would be exerted as follows: A form of hydrocarbon is thrown into the circulation through the portal system which substitutes the normal supply of fats by the lacteal system. The affinity of oxygen for alcohol being greater than its affinity for fat, respiration is supplied from this artificial source with carbon for direct combustion; an artificial nutrition is kept up, in which the natural call for fat is stopped, and the function of the pancreas is reduced to supplying the minimum quantity necessary for histogenetic purposes. To this inactivity of the organ is added the usual tendency to degeneration due to alcoholism. In course of time the pancreas loses that minimum amount of function which it had been allowed to exert, and fails to supply even so much fat as was necessary to protect the albuminoid tissues, and tuberculosis results. Or, as frequently happens, the toper ceases to obtain his supply of alcohol, either from inability to get it or from inability to absorb it or retain it on the stomach. His artificial supply of carbon, upon which he has been depending, is thus cut off, a sudden call is made upon the pancreas for that which it has now lost the power to give, the tissues are disintegrated in order to supply the required fat elements, and tubercle is produced.

The Doctors Williams,²⁸ who have certainly had an unusually extensive experience with consumptives, from their connection with the Brompton Hospital for Consumptives, have no hesitation in assigning a large amount of phthisis to the predisposing cause of alcohol, "in spite of Doctor Walshe and other eminent authorities." They add, "it is extraordinary how easily in the lungs of a toper the tuberculous masses break down and how rapid the course of the disease proves."

Pidoux²⁹ attempted to reconcile the two opposing opinions on the influence of alcohol. Believing that alcoholism is a cause of phthisis, he nevertheless held that it is also one of the factors which are antagonistic to the disease. The reason lies in the fact that alcoholism varies in different people. In sanguinous, vigorous, well-nourished persons it produces an effect more or less analogous to gout, carbuncle, abdominal plethora, hypersecretion of uric acid, etc., creating antagonistic rather than favoring conditions for the development of phthisis. In feeble, badly nourished persons who drink bad wine to excess, phthisis is, on the other hand, frequent.

More recently Amat³⁰ and Thorain,³¹ both inspired by the opinions of their teacher, Professor Lancereaux, have reviewed the question under consideration. According to Amat, it is to-day admitted by almost everybody that by his excessive drinking the drunkard becomes only too often a preferred candidate for pulmonary tuberculosis. But he goes further, and maintains that the alcoholic origin imprints upon the tuberculous disease a peculiar character by which it differs from phthisis of other origin. Thorain, who, like Amat, relates a series of case histories of alcoholic consumption, finds that alcoholism is far from exerting a preserving or therapeutic action against tuberculosis, but contributes manifestly to its development, by causing alterations in the organs, by debilitating the system. For Dr. S. Bernheim³² the abuse of alcohol favors the breaking out of tuberculosis. It has been noted, he says, that in France consumption increases in a parallel rate with alcoholism. The effect of alcohol is due to its weakening action on the organism. This effect is evidently the proper explanation of the predisposing action of alcohol, and may occur from various other preceding diseases, such as anæmia, diabetes, and acute infections (Gottstein³³). This weakening effect is accepted to-day by the foremost clinicians as undoubted; still, the idea carried to an illogical conclusion is objected to, for instance, by Martius,³⁴ who strongly condemns the extreme view of Legrain pronounced at the Ninth International Congress against Alcoholism, in Bremen, 1903, to the effect that tuberculosis occurs exclusively on the foundation of alcoholism. Legrain even went so far as to demand that the funds which are used for the struggle against tuberculosis be deviated from that purpose and employed for the struggle against alcoholism, because with its removal the problem of tuberculosis would also find its solution.

My former teacher, Prof. G. v. Bunge³⁵ in Basel has for years investigated the deleterious effects of alcohol upon the animal organism and sees in it the cause for a great many ills. In the last edition of his text-book on physiology he says it can not be denied that a predisposition to disease is inherited, and that this predisposition may be acquired on the part of the parents by an abnormal mode of living, especially through alcoholic and other poisoning. Espina y

Capo³⁶ declared before the Paris Congress on Tuberculosis, in 1905, that alcoholism and tuberculosis form the worst possible combination, that every alcoholic is a candidate for tuberculosis. Reynier³⁷ has been struck by the observation that in external tuberculosis occurring after the fortieth year of life, the abuse of alcohol is frequently the only predisposing factor which can be ascertained, and that in such cases all history of family taint is generally absent. Crothers³⁸ quite recently demonstrated in a study of 100 cases of alcoholism that it lowers the vitality and resistance, and predisposes to consumption, and Cornet³⁹ explains the favoring influence of alcohol on the development of pulmonary phthisis thus, that the ciliated epithelial cells are, by alcohol, temporarily weakened and paralyzed, so that one important defensive provision against the inhalation of tubercle bacilli is rendered inactive. Another harmful consequence he sees in the weakening of the heart muscle.

The general conviction thus prevails that alcoholism is distinctly a predisposing factor for the acquirement of tuberculosis, by virtue of its enfeebling, paralyzing effect on the defensive apparatus of the organism and the general systemic resistance to infectious diseases. For centuries it has been realized that everything which disturbs the strength of the organism and interferes with nutrition predisposes to phthisis, and it is undoubtedly this result of chronic alcohol poisoning which lessens the resistance to infection. We may fittingly conclude this literary study with the words of Prof. S. Adolphus Knopf,⁴⁰ in his article on "Tuberculosis" (*Twentieth Century Practice*, 1900, vol. 20, p. 187):

That alcoholism is one of the greatest direct and indirect causes that prepare the field for the tubercle bacilli is now generally conceded, not only by physicians and sanitarians, but also by all sociologists who have studied the question. It is not only a phthisiogenetic disease par excellence in adult life, but, according to statistics carefully kept in some of the European hospitals for scrofulous children, in more than 50 per cent of the cases either the father or the mother, or both, were found to be or to have been alcoholics.

In the subsequent chapter we shall find these ideas justified by experiment.

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ALCOHOL AND ITS INFLUENCE ON PUBLIC HEALTH.

By GEORGE W. WEBSTER, M. D.,

President Illinois State Board of Health.

Good health with length of years is the greatest asset of the individual and of the nation. It follows that the state as well as the individual is, or should be, vitally concerned in all that pertains to the welfare of the individual. There is no such thing as public welfare without public health. On the other hand, there is no commodity of which civilization has been and is so wasteful as of human life. I do not hesitate to say that it is my opinion that the alcohol problem is, from a moral, ethical, sociologic, scientific, economic, medical, and public health point of view, one of the most vitally important unsolved problems of the world to-day; and the public health phase of the question is not the least important. It is to-day perhaps the most baffling and serious obstacle in the way of man's progress toward a higher evolution.

The alcohol problem is intimately and intricately interwoven with our whole modern life, with politics, with the industries, with government revenue; but I shall speak chiefly from the public health side of the question.

I can not do better than quote from the very able address of Prof. W. T. Sedgwick in the annual address in medicine at Yale University last year. He said,¹ in speaking of the alcohol problem:

When one considers in detail the relations of alcoholic indulgence to disease, the numerous and important ailments of which it is the direct cause, to say nothing of the indirect influence on human misery and degeneracy, one can hardly avoid realizing that it stands almost, if not altogether, in the front rank of the enemies to be combated in the battle for health.

I believe that the prevention of alcoholism, which is a preventable disease, the prevention of individual and national deterioration through its injurious effects, comes as much within the sphere of action of the medical health officer as tuberculosis or smallpox. I believe that any preventable disease which has a distinct bearing on individual efficiency and national progress comes clearly within the duty of the public health officer.

To understand the alcohol problem fairly, in all its bearings, it should be viewed in the light of history which clearly shows that moralists, fanatics, empirics, and even physicians and psychologists, have experimented in well-meant ignorance, fettered as they were by limited scientific knowledge and "shackled by the dead hands of ignorance and authority."

We must consider it as a biologic problem, as a medico-sociologic problem; the latter simply as a part of that great medico-sociologic problem which is concerned in a comprehensive study of the nature, action, and reaction of man and his environment, all based upon a sound pathologic foundation.

It must be viewed from the standpoint of the trained psychologist, and investigated in accordance with his modern laboratory methods.

The alcohol problem should be viewed as but a part of the large public health problem in which it is now quite generally recognized that the most valuable, effective means of coping with an evil consists in the concentration of all available agencies energetically upon its prevention.

We should attack the problem in accordance with the principles and practices and the spirit of modern scientific research, and should then attempt to apply this knowledge to measures of practical reform. Public health is receiving a greater degree of attention than ever before, from the President, from sanitarians and health officers, and from the people, through an enlightened public-health sentiment. "If, in this great forward general movement for sanitary reform and public-health work, we ignore the alcohol problem, it will leave a great gap in our line of battle."

In order to gain a better idea of the importance of the problem, let us discuss briefly its cost to the nation; its influence upon infectious diseases; its death rate, and its influence upon the general efficiency of the individual.

It is impossible to accurately estimate the cost of alcohol to the people of the United States. However, some of the items can be stated with reasonable accuracy.

It is estimated that 50 per cent of municipal expenditures for the maintenance of police departments is for the arrest of the intoxicated portion of the population. Add to this the cost of trial, conviction, and maintenance of convicted persons in jails, penitentiaries, etc.

It is estimated that 20 per cent of the insane owe their insanity directly or indirectly to alcohol, and there are probably at least 150,000 insane persons in the United States, cared for at public expense. Assuming that 20 per cent of these owe their insanity to alcohol, and that McDonald's estimate of \$400 is the loss per person per annum to the State, we have for this one item alone the sum of \$12,000,000. This corresponds exactly with the estimate of Dr. Frederick Peterson.²

Add to the foregoing the loss of time of those convicted of crime, the loss of time while intoxicated, or while recovering from its effects.

The Census Bureau reports show that the liquor and beverage industries are capitalized at \$534,000,000, and 5 per cent of this means an annual cost of \$26,700,000.

The consumption of alcoholic liquors in the United States in the year 1907, amounted to 2,019,690,911 gallons,³ a per capita consumption of 23.53 gallons as against 17.68 in 1900, and Mr. Powers, chief statistician for agriculture, estimates that the amount spent for the above is from \$1,000,000,000 to \$1,200,000,000 per annum.

Prof. Irving Fisher, in his paper read before Section V of the Congress on Tuberculosis at Washington, D. C., 1908, estimates the annual death rate from tuberculosis in the United States at 138,000,

and he also estimates the money cost including capitalized earning power lost by death, to exceed \$8,000 per death.

Assuming that the death rate from alcohol is as great as from tuberculosis (and I shall try to show that this is a fair assumption), then the annual cost to the United States in amount lost by death is at least \$1,004,000,000. Adding these four items and leaving out the large amount of municipal expenditures, and we have the enormous total of \$2,142,700,000. This would give over \$15,000 to the family of every one of the 138,000 persons dying annually of tuberculosis in the United States.

The total direct and indirect cost of Great Britain's drinking is estimated^a at \$1,750,000,000.

MORTALITY.

Our mortality statistics of alcoholism are very incomplete, owing to the fact that probably few physicians put down the cause of death as alcohol, even though they know it to be the cause. Out of consideration for the feelings of the family, alcoholic gastritis is put down as chronic gastritis. Alcoholic cirrhosis of the liver is simply cirrhosis of the liver, alcoholic insanity as insanity, and alcoholic nephritis as Bright's disease.

Probably Switzerland and Denmark are the only countries in the world in which the returns are reasonably accurate, the reason being that they are the only countries of Europe in which *the secret medical* is guaranteed, and the death certificate is not seen by the relatives.

Fernet of Paris⁴ estimates that alcohol is the principal or sole cause of 10.2 of the total mortality, and is the adjuvant or accessory cause of 23.60 per cent additional. Among the insane it is the cause of 50 per cent of the mortality.

Crothers⁵ estimates that alcohol is the direct and indirect cause of from 10 to 20 per cent of all deaths.

In estimating the mortality from alcohol, it is necessary to take into consideration its influences in favoring the occurrence of probably all infections and their greatly increased mortality under its use. For example, Dr. Robert H. Babcock estimates the death rate of pneumonia among alcoholics as 50 per cent. In addition to these we must take into consideration many permanently diseased conditions due to progressive alterations that take place in tissues as a result of the change in their metabolism due to alcohol. Sir Victor Horsley's list⁶ of these diseases is as follows:

Diseases due to alcohol alone: Acute alcoholic poisoning, acute mania, delirium tremens, chronic alcoholic insanity, alcoholic epilepsy, alcoholic neuritis.

Diseases of which alcohol is frequently a determining or a contributing cause: Pharyngitis, gastritis, chronic dyspepsia, dilatation of the stomach, congestion of the liver, cirrhosis of the liver, fatty liver, chronic Bright's disease, gout, glycosuria, obesity, congestion and overgrowth of glands and skin, functional disorders of the ovaries and breasts leading to a sterility and inability of mothers to suckle their infants at the breast, dilatation of the heart, fatty heart, arteriosclerosis, increased susceptibility to inflammatory diseases of the eyes, inflammation and degeneration of nerve structures, including

the optic nerve, epilepsy, melancholia, dementia, imbecility, hysteria, idiocy, and sunstroke.

If we add to the foregoing the deaths from accidents due to alcohol, the infant mortality due to alcoholism among the mothers, the premature deaths due to alcoholism,⁷ it is very easy to believe that the estimate that 10 per cent of all mortality is due to alcohol is a very reasonable one.

It has been shown⁸ that in Great Britain from 25 to 51 per cent of total poverty is due to intemperance. Poverty is one of the main causes of premature sickness and death.

ALCOHOL AND LIFE EXPECTANCY.

Arthur Newsholme,¹⁰ in the chapter on "Alcohol and public health," after reviewing the experience of the United Kingdom Temperance and General Provident Institution, from 1849 onward, in which the recorded experience concerned 31,776 whole life policies of nonabstainers, passing through a period of 466,942 years of life, and 29,094 whole life policies of abstainers, passing through 398,010 years of life, and after showing the greater life expectancy of the latter he says:

In alcoholism we have to deal with a chief cause of national inefficiency. This inefficiency is partly caused by the sickness and mortality due to alcoholism, and the numerous diseases which it favors, or actually produces, including insanity. Alcoholism is a chief cause, if not actually the chief cause of poverty. The evil really wrought by alcoholism is much greater than any official figures reveal.

ALCOHOL AND MENTAL WORK.

At the meeting of the British Association for the Advancement of Science,¹¹ it was the "unanimous agreement that alcohol, even in the smallest amounts, is deleterious to the quality of mental work."

Among people of average neuropsychic equilibrium, the exact large number of individuals in whom alcohol, when taken even in moderate doses, brings to light, often with a startling rapidity, their latent defect. This marked intolerance of alcohol is exhibited by the epileptic, the imbecile, and the degenerate. To the neuropathic and psychopathic, to the hereditarily burdened, it is pregnant with disaster.

EFFECT UPON FATIGUE AND ENDURANCE.

Speaking on this subject, Sir Frederick Treves, in the course of an address delivered at Westminster, London, said:

I was with the relief column that moved on to Ladysmith. It was an extremely trying time apart from the heat and the weather. In that column of 30,000 men, the first who dropped out were not the tall men, nor the short men, but the drinkers, and they dropped out as clearly as if they had been labeled with a big letter on their backs.

Dr. W. H. R. Rivers, in the Croonian lectures delivered at the Royal College of Physicians in 1906, on "The influence of alcohol and other drugs on fatigue," after reviewing the immediate effects of alcohol upon muscular work, says:

In observations which have been made on large masses of men in campaigns, etc., the results point strongly to the conclusion that alcohol is prejudicial to the capacity for work and in no way helps to diminish the effects of fatigue.

The work of Hellsten ¹² is the most extensive that has been done on the action of alcohol, and seems to clearly prove the injurious influence of alcohol on the capacity for muscular work.

Professor Aschaffenburg has demonstrated ¹³ that in such work as typesetting, and where the experiments were carried out with all the rigor of psychological methods, there is an average loss of working efficiency of 10 per cent. All of the men who took part in the tests admitted that after Sunday indulgence they found Monday's work more difficult and they made more mistakes on that day.

Major Blackham, of the British army, in a recent paper ¹⁴ before the army and navy section of the British Medical Association on the subject of "The feeding of the soldier," concludes that "alcohol is unnecessary in any form or in any quantity, under any circumstances that may occur in military affairs." He restricts these observations to the healthy man.

Lieut. Col. Edmond Monkhouse Wilson, of the British army, in his president's address ¹⁵ before the navy, army, and ambulance section of the British Medical Association, July 30, 1908, in speaking of alcohol in the services, says: "Exertion of the body is better borne without than with alcohol; this has been proved most conclusively." He quotes Schneider, the German observer, who examined 1,200 mountain climbers and found that "as long as continuous efforts and difficulties are to be expected, no alcohol should be taken."

He says further:

In the exposures and fatigues of war it has been demonstrated that alcohol is quite unnecessary to enable troops to support them effectively and cheerfully; nor are they endured any better when alcohol is consumed, but, on the contrary, worse.

After describing military campaigns which include the extremes of heat and cold and of malarious climates, in which he says the bodily exertions of the troops were "extreme," he further says:

All prove that very great exertion and exposure to extremes of temperature can be better borne without alcohol than with it. As to great cold, opinion is unanimous among the well informed; all alcohol is more or less hurtful. The experience of arctic voyagers and Alpine guides is singularly concordant as to this. As to great heat, the evidence is equally conclusive.

On all these points Maj. G. S. Crawford ¹⁶ is in entire and emphatic accord.

ALCOHOL AND THE ACUTE INFECTIONS.

One of the most important phases of this problem is the influence of alcohol upon susceptibility to infection and upon the course of the infectious process, once it is started. It seems to be clearly established that alcohol when used experimentally destroys the resisting power of the animal to germs.

Prof. William H. Welch ¹⁷ summarizes the action of alcohol as follows:

Alcoholic intoxication increases the susceptibility of animals to many infections, and influences unfavorably the process of immunization. Pregnant rabbits repeatedly intoxicated by alcohol are likely to abort, and to die soon afterwards from some accidental infection. Many of their young die a few days after birth.

Maj. G. S. Crawford, of the British army, says: ¹⁸

Alcohol by its devitalizing action on the tissues of the body renders those who habitually use it more liable to attacks of various forms of disease. It is one of the strongest

predisposing causes to tuberculosis, and regiments in which the greatest amount of alcohol is consumed have the largest percentage of men invalidated from this disease. Drinkers have less recuperative power after severe injury or operation.

He further quotes Sir Frederick Treves as saying, "Having spent the greater part of my life in operating, I can assure you that the person of all others that I dread to see enter the operating theater is the drinker."

Professor Metchnikoff recently demonstrated¹⁹ that alcohol, even in small doses, paralyzes the phagocytes and renders them incapable of protecting the body against microbic invasion.

This is in line with the work of Kesteren on the influence of alcohol on living protoplasm, and reported in the same journal. He says:²⁰

There was absolutely no sign of any stimulating effect. The effect upon them was in all cases the same, it being simply a question of the degree of paralysis induced.

George Rubin²¹ has shown that alcohol decreases and finally, in 1 to 50, suspends phagocytosis completely in vitro, brought about probably by some change in the cell protoplasm.

Wright's observations have shown²² that the tuberculo-opsonic index is definitely and positively lowered by alcohol.

The work of Dr. Reid Hunt, of the United States Hygienic Laboratory, published in February, 1907, shows that even small doses of alcohol increases the susceptibility of animals to infectious diseases and lowers the vitality of their offspring.

Prof. T. Laitinen, at the Stockholm International Congress, reported²³ the results of his experiments and investigations and showed that small quantities of alcohol (that is, an amount equal to half a pint of 3½ per cent beer for an adult man) lowered the resistance of rabbits and guinea pigs to infection.

ALCOHOL AND TUBERCULOSIS.

William Ewart, St. George's Hospital, London, says,²⁴ in speaking of this topic:

I hold with Knopf, who declares that in any stage or form of pulmonary tuberculosis large quantities of alcohol are contraindicated. In direct opposition to those who look to alcohol for an additional element of nutrition, we should dread any such contribution as a Danaan gift.

And again:

The better rule is to keep our patients independent of alcoholic beverages, even at meals.

The international congress on tuberculosis which met in Paris in 1905 passed the following resolution:

That in view of the close connection between alcoholism and tuberculosis, this congress strongly emphasizes the importance of combining the fight against tuberculosis with the struggle against alcoholism.

As regards resistance to disease, Prof. William H. Welch says:²⁵

This lowered resistance is manifested both by increased liability to contract the disease and by the greater severity of the disease.

Sir Victor Horsley says:²⁶

In the case of illnesses such as pneumonia and blood poisoning, it is proved that the alcohol habit notably diminishes the power of the tissues to resist the invasion by these same organisms.

In the case of diphtheria, very numerous experiments have shown that alcohol, when given to the animal before or after infection to diphtheria, diminishes normal resistance of the organism of the animal to infection in a very definite way.

It has been proved by Doctor Delearde and others that immunity against disease can not be obtained so easily by those habituated to the taking of alcohol. For example, he found ²⁷ that alcoholized animals could not be immunized against rabies, "the alcoholized animals remaining as susceptible to the disease as if no attempt had been made to vaccinate them."

CONCLUSIONS.

The alcohol problem is more important than the tuberculosis problem as (1) it costs more lives and more money; (2) it costs the United States over \$2,000,000,000 annually; (3) it probably causes, directly and indirectly, at least 10 per cent of all deaths in the United States; (4) it predisposes to infection, destroys acquired immunity, prevents the occurrence of artificial immunity, at least in rabies, lessens resistance, leads to an increased mortality in all infectious diseases and after surgical operations; (5) it lessens the power of the individual to resist the injurious influences of extreme heat and cold; (6) it causes a deterioration of the quality of mental work; (7) it diminishes the power to withstand fatigue and lessens the general efficiency of the individual; (8) it is a poison and should be classified as such, instead of as a food or stimulant; (9) when the physicians take hold of the question in the same spirit as they have shown concerning yellow fevers, malaria, and smallpox, instead of treating it as a moral question and leaving it to clergymen, temperance workers, and enthusiastic reformers, we may expect better results; (10) more may be accomplished by teaching the people the truth in regard to the fatal effects of alcohol upon mental and physical efficiency than by expatiating on the moral wickedness of drinking.

We deserve condemnation as a profession, when we assume the attitude of sneering contempt for the efforts of clergymen, laymen, enthusiasts, and reformers in their attempts to stamp out this evil, just as we would deserve it if we would assume the same attitude toward them if they attempted to stamp out yellow fever and malaria. Fortunately, the question is receiving new attention by earnest men who have the courage of their convictions and who see with clear vision, and who will not be deterred by sneers or criticisms.

Public opinion demands, and has a right to demand, in no uncertain tones, that the action and influence of alcohol be determined and settled by the medical profession, and that we then teach the people the truth fully, conscientiously, and fearlessly.

In closing I can not do better than again quote Prof. W. T. Sedgwick, when he says:

Whatever may be the practices or prejudices of some of its individual members, the medical profession should stand for temperance as one great essential of public health. That there has been too much neglect of the matter in the past is all the more reason why the profession should do its full duty now and in the future.

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DYSPEPSIA AND ITS RELATIONS TO INEBRIETY.

By D. H. KRESS, M. D.,

Superintendent Washington, D. C., Sanitarium.

In a leading editorial which appeared one year ago in a New York daily the significant statement was made: "There is no denying the fact, we are in the midst of an epidemic of crime." That this epidemic still prevails may be seen by glancing through the columns of any one of our daily papers. The headings in a paper I recently looked through ran as follows: "Kills employer and self," "Supposed suicide under arrest," "Band terrorizes railway patrons," "Secures divorce," "Pastor assassinated," "Believed to have ended his life."

Reports of murder, suicide, divorce, and crime are so common that they no longer create alarm. We have in a measure become familiar with them, and yet the newspapers of our large cities give but a partial and incomplete report of the crimes actually committed.

It is universally recognized that alcohol is in a great measure responsible for this sad social state.

The evils which to-day are so apparent have proved the ruin of nations of the past. It was when Belshazzar, the king, made a great feast to a thousand of his lords, and drank wine before the thousand, that the words appeared, "Thy kingdom is divided and given to the (more temperate) Medes and Persians." These same evils brought destruction to the antediluvians.

"In the days that were before the flood" drunkenness was responsible for the immorality and the sad social condition that existed. "Every imagination of the thoughts of man's heart," we are told, "was only evil continually."

The marriage vow was lightly regarded. The record informs us, "They took them wives of all which they chose."

Corruption prevailed. "The earth also was corrupt, and the earth was filled with violence." There evidently existed then, as to-day, "an epidemic of crime."

That which inflamed and maddened the minds of men before the flood and led them to commit the most unnatural crimes is dethroning reason to-day, and is almost wholly responsible for our houses of prostitution, insane asylums, hospitals, almshouses, prisons, etc.

Sir Andrew Clark said:

Out of every 100 patients I have charge of at the London Hospital, 70 per cent directly owe their ill health to alcohol.

According to the testimony of judges who legally sever the matrimonial banns in court, "more than two-thirds of the divorces are occasioned by the use of intoxicants."

One judge says:

There is not one case in twenty where a man is tried for his life in which alcohol is not the direct or indirect cause of the murder.

A district attorney of Boston declares "ninety-nine out of one hundred of the crimes in our Commonwealth are produced by intoxicating liquors."

The Maoris of New Zealand, according to Captain Cook, were, at the time when he first visited the island, almost perfect in physique. Even the old men, he states, possessed the endurance of youth. They numbered then over 120,000. Alcohol and tobacco found their way to them as the island became inhabited by the white race. Men, women, and children began to drink and smoke, in their innocence believing it a blessing. To-day the Maoris are a race of physical and moral degenerates, numbering only 41,000.

Chief Justice Stout, of New Zealand, in passing sentence upon a drunken Maori a few years ago, said:

If this drink is not stopped among the Maoris we are in measurable distance of the time when the Maori race, the noblest race with which civilization has been brought in contact, will be exterminated.

The same results are witnessed among other races. In speaking of the Hawaiians, a Honolulu paper, in an editorial, contained the statement:

There are now living men of voting age who will witness the death of the last full-blooded Hawaiian.

Sad are the results of tobacco and alcohol on these races. Some attribute the probable extermination of these races to their immorality, but fail to recognize alcohol as the cause of the immorality that is manifested.

The decreasing birth rate in civilized lands finds a partial explanation in the prevalent use of alcoholic beverages. The number of children born in these countries to-day does not suffice to continue these races. France shows a shortage of births of over 19,000 during the year 1907—that is, the death rate exceeds the birth rate by this number. Professor Cattell, in taking the census among the poor of New York, in 22 apartment houses found only 54 children distributed among 485 families—that is, 1 child to every 9 families. Among the upper classes a similar condition exists. He states that "the Harvard graduate has on an average seven-tenths of a son" and "the Vassar graduate has one-half of a daughter." This lowering in births may in part be attributed to preventive measures, but among the Maoris no preventive measures are employed, and yet the same condition exists. The diminished birth rate among them is due chiefly to a loss of reproductive power, resulting from alcoholic degeneracy.

While all are more or less familiar with the results of alcoholism, few have inquired into or are familiar with the physical causes which are responsible for the free use of alcohol.

Why do men and women desire alcohol? There is nothing desirable about the taste. It does not appeal to the palate. It is a significant fact that of all creatures that exist man alone possesses a craving for strong drink, and among mankind the craving is well-nigh universal.

Some, after learning the deceptive nature of alcohol, and the evils which it is responsible for, have sufficient will power to regulate, or abstain altogether from, its use. Others, knowing all this, satisfy the craving at any cost; among these we find the mental defectives.

The fact that nearly all inebriates give clear evidence of being mentally defective has led to the conclusion by scientists that only mental defectives become inebriates.

This forces upon us the question, Why do we have in our midst so many mental defectives? Alcohol is known to be a disturber of the functions of muscular activity, of mental energy, of the circulatory system, and in fact of the function of every cell of the body. At first it produces irritation, which may be mistaken for stimulation. Later, when absorbed by the living cells, it deadens and slows their activity. It deadens the mind so that one is unable to discern between the sacred and the common; between right and wrong. The weakness in the animal nature becomes manifest. It awakes the sleeping lion of heredity.

Prof. C. F. Hodge, of Clark University, to ascertain its influence upon the brain and disposition, gave alcohol to two kittens, with very striking results. In beginning the experiment, he says, it was remarkable how quickly and completely all the higher psychic characteristics of both the kittens "dropped out." Playfulness, purring, cleanliness and care of the coat, interest in mice, fear of dogs, while normally developed before the experiment began, all disappeared so suddenly that it could hardly be explained otherwise than as a direct influence of the alcohol upon the higher centers of the brain.

Continued functional disturbances of this character in any organ will in time bring about structural changes of the organ. We are well aware that continued disturbance of the circulation in time puts a permanent stamp upon the blood vessels and the heart; and that the liver and kidneys of the drinker undergo organic changes of a serious nature. Continued disturbances of the brain also leaves an indelible and permanent record on the tissues of the brain. These mental defects are transmitted from parent to children. For this reason the mental defectives are usually found among those whose parents have been users of narcotics, and especially of alcohol.

It is not necessary for parents to drink to excess in order to bequeath such an inheritance to their offspring. In fact, occasional spree's afford an opportunity between times for the establishment of a normal condition and are therefore not so injurious either to parents or their posterity as the continued use of alcohol in small doses. Brain degeneracy to some extent exists in every child born of alcohol-using parents. In the second generation of alcohol users the degeneracy becomes more manifest, while as a rule it remains for the third or fourth generation to reap the full result of alcoholism. Doctor Joffrey says:

Alcoholism begins with the father and strikes down the children, and generally its action continues until in the fourth or fifth generation it has destroyed the family.

The efforts put forth by temperance workers has proved a benefit to the moderate drinker; to those who have sufficient mental power to exercise restraint and avoid drink after knowing its influence, but it has failed to reach the class that need help most—the mental degenerate who lacks the power to do what he knows to be right.

If inebriety is due to structural brain changes, is there any help for the inebriate? While I could not take the position that all are curable, from my experience in the treatment of these cases during the past twenty years I am convinced that even advanced cases of inebriety should not always be regarded as hopeless. Many of them

can be cured by proper treatment, providing they can be kept under treatment a sufficient length of time. The treatment should, however, be directed chiefly toward the removal of the craving for drink, for without this craving the mental defective is as secure against the use of alcohol as the one who has no such defect.

Dietetic errors I believe to be largely responsible for the craving for alcohol and indirectly therefore for the results of alcoholism. If this is so, reforms must begin in the home.

In describing the causes of violence which filled the earth in the time of the flood it is stated, "They were eating and drinking, marrying and given in marriage." One naturally followed and was the outgrowth of the other. Errors in eating were responsible for the use of strong drink, and strong drink was the cause of domestic unhappiness, divorce, and crime.

A person who is a mental defective and possesses this craving may pass through life without ascertaining what he craves, but the first glass may be sufficient to make him a slave to drink, after having discovered it is alcohol he craves, or he may become a slave of some other drug or patent medicine.

A woman in Liverpool, who was an inebriate, said to me:

My doctor recommended me to take some ale after giving birth to my second child; from the time I took the first drink, although I did not like the taste of it, there has been present a craving for it which I can not resist. I often go past a saloon as rapidly as I can only to return and enter, and when one drink has been taken all self-control is gone.

She was desirous of doing right, but was evidently one in whom there existed a peculiar mental weakness. She would have been safe from drink even though this mental disease existed did she not in addition possess a craving for strong drink, a craving which she was no doubt unconsciously cultivating in her home by what she ate and drank at her table. It was not until she took the beer prescribed by her physician that she became conscious of what her system craved, and being once conscious of it, the weakened will was unable to deny the craving.

I remember hearing one of England's leading temperance lecturers say, at a public gathering, she had great sympathy for the woman who is a slave to beer, "Because," she said, "although it is fifteen years since I touched it, I still possess the same desire for it I did then." At the time I thought this remark a very strange one to be made by an advocate of temperance.

Recently I heard a noted American temperance lecturer say:

No man or woman in this audience is fonder of the taste of cocktails and wine than I am. The taste has been handed down to me, but I hate the stuff.

In what respect do these temperance advocates differ from their more unfortunate sister? In common with her they possessed a craving for drink, but while they were mentally well balanced their more unfortunate sister was not. Although she, too, may "hate the stuff," she takes it just the same.

Could we enter the homes of these lecturers on temperance and note what they eat and drink at their meals, we should probably find the explanation of their craving for narcotics.

The saloon keepers have by experience and observation been taught that certain foods create an unnatural irritation or thirst that water can not quench. They keep a lunch counter for their patrons

not because they have compassion on the unfortunate poor. If it was an act of pure benevolence on their part, we would expect them to feed not merely the drunkard, but the drunkard's wife and children. With them it is a matter of business. The secret of the free lunch table we may discover by taking an inventory of the food that is found upon it. It is not laden with juicy peaches, pears, oranges, etc. They know that such foods would ruin their business. We find upon this table sausages, pickled pigs feet, smoked ham, mustard, pepper, and other irritating products. Experience has taught the saloon keeper that these things create a thirst which calls for alcohol, and therefore it aids him in culling out his victims—the mentally defective.

The sad feature about this is, many a good wife and mother is supplying her husband and sons with the same kind of food that is found on the table in the saloon, and is thus unconsciously cultivating in the members of her family a craving which leads to the open saloon door.

The poor drunkard, who, when admonished to straighten up and be a man, said, "You good people have a great deal to say about my drink, but you have nothing to say about my thirst," could no doubt be classed as a mental defective, yet this man realized that if it was not for his insatiable thirst he would experience little difficulty in giving up drink.

None too much has been said about the evils of strong drink and the need of doing away with the saloons which afford such an alluring temptation to those who crave drink and are mentally weak, but the time has come when, if physicians, temperance advocates, and lovers of humanity would accomplish their ends, something more must be said in regard to the unnatural thirst these poor drunkards have and how it may be gotten rid of. For, after all, it is this thirst and not the existing mental defect that makes the inebriate.

I believe with Dr. Lawder Brunton that schools of scientific cookery conducted for the benefit of the wives and mothers of the laboring classes would do more to abolish strong drink and to close our saloons than any number of teetotal societies, for as long as the craving for drink exists, the mental defectives will satisfy it, if not with alcohol, with some drug perhaps more injurious. This has been demonstrated repeatedly. In France they resort to absinthe; in the South where alcoholic beverages are prohibited the use of cocaine and other drugs is becoming almost universal among the negroes.

Since we can not of a certainty determine in whom and to what extent this mental defect exists until weeded out by the saloon, it is right that the saloon should be closed to all in order to protect the weak, but with the closing of the saloon there should be carried forward an educational effort pertaining to diet.

Flesh foods served so abundantly at our modern tables are responsible for much of the craving which causes drunkenness. For this reason, in countries where flesh foods are freely used, alcohol is also freely resorted to. Alcohol antidotes for a short period the effect of the uric acid taken with the flesh. Uric acid, caffeine, and theine act as irritants, and thus call for a narcotic to deaden the unpleasant sensation. Again, the uncomfortable feeling resulting from the high blood pressure produced by meats, can temporarily be removed by lowering the blood pressure by the use of alcohol. For the meat eater to keep comfortable, however, it will be necessary for him to keep in a mild state of alcoholic intoxication all the time. The prevalent use

of meat is therefore without doubt responsible in part for the free use of alcohol, and for this reason alcohol and meat eating are so intimately associated.

Professor Ganthier, by carefully conducted experiments covering a period of many years for the purpose of ascertaining the influence of various foods upon the disposition of animals, discovered that he could change their disposition by changing the nature of their food. White rats, as long as they were fed on breads and grains, were very gentle, but when given flesh to eat they became quarrelsome and destructive. This is no doubt partially due to the local irritation caused by the excessive production of a highly acid gastric juice resulting from the glandular stimulation of the uric acid and other wastes found in the meat, and partially by the direct influence of the urates and other unoxidized wastes upon the sympathetic nervous system when absorbed. Ganthier's conclusion is that "a flesh diet is a more important factor in determining a savage or violent disposition in any individual than the race to which he belongs." We may probably have here an explanation why families, and often members of the same family, differ so widely in disposition and why some are given to drink while others are not. It would certainly be of interest in studying this matter to note the foods each is especially fond of. Why should not the experiments which have been so successfully conducted in laboratories, by scientists upon animals, be carried into the home? Should this be done, we would probably appreciate the need of having intelligent and scientific cooks instead of trusting so important a matter as the preparation of foods to the most ignorant and illiterate class, as we now do.

Dr. Baron Liebig said:

The ingestion of flesh produces in carnivorous races a ferocious and quarrelsome disposition, which distinguishes them from nonmeat eaters.

There can be no doubt that the products in meat which tend to make men ferocious and quarrelsome by the excitation which they produce also pave the way for strong drink, and that, other things being equal, the more flesh a man consumes the greater will be his craving for narcotics, and the more serious will be his danger of becoming a drunkard.

Even among the ancients the intimate relation existing between the consumption of flesh and drunkenness was observed. The admonition is given, "Be not among wine-bibbers; among riotous eaters of flesh." And again, mention is made of a class who were "slaying oxen, killing sheep, eating flesh, and drinking wine."

Daniel's strength of mind to refuse the wine served at Babylon's royal table may be in part attributed to the nature of the food of his choice. Daniel was evidently accustomed to a fleshless and simple diet; therefore when commanded to eat at the king's table he "purposed in his heart he would not defile himself with the king's meat nor with the wine," but said, "Let them give us pulse to eat, and water to drink." There was a natural association between Babylon's meat and their wine, while the food which Daniel chose demanded no stronger drink than water.

We have here the reason why, in order to elevate the Israelites physically and morally, they were taken away from the fleshpots of Egypt and were given instead of meat manna to eat and water out of the rock for their thirst. In this lies the hope of elevating the

people of to-day physically and morally, for it is only in this way that we shall succeed in getting rid of strong drink and its results.

At the beginning man was placed in a garden and surrounded with trees pleasant to the sight and good for food. The command was, "Of every tree thou mayest freely eat." Had man always continued to freely eat of fruits, and to live on the simple foods to which his attention was then directed, strong drink would probably be unknown, for it is impossible for anyone to cultivate a taste for fruits and a craving for strong drink at the same time, and, furthermore, it is impossible for even an inebriate, unless he is an utter degenerate, to live on these simple foods exclusively for six months without losing his craving for strong drink. On this point the editor of the *London Clarion* some time ago related his experience, in an editorial. He said:

I have just turned vegetarian. My friends are surprised; so am I. But whereas they are surprised that I have adopted this diet, I am surprised that I did not do it years ago. In one way the effects of the diet have surprised me. I have been a heavy smoker for more than twenty years. If there was anything which I feared my will was too weak to conquer it was the habit of smoking. Well, I have been a vegetarian for eight weeks, and I find my passion for tobacco is weakening.

Again, I have found I can not drink wine. Why do I write these confessions? Because these things have come upon me as a revelation; because I begin to see that the great cure for the evil of national intemperance is not a teetotal propaganda, but vegetarianism.

It will be observed that that which his will was too weak to conquer while subsisting on a mixed diet he had no difficulty in giving up after he had eliminated flesh from his dietary. This demonstrates that for the mental defective a meatless diet is essential. "One believeth he may eat all things; another who is weak eateth herbs." But to the mentally strong the words are addressed: "It is good neither to eat flesh nor to drink wine, nor anything whereby thy brother stumbleth or is offended, or is made weak," for that which is so injurious to the weak will in time weaken the strong. For years we have successfully employed a meatless diet in connection with other measures in treating alcoholics in our sixty or more sanitariums. We have had it demonstrated repeatedly that upon a nonirritating, nonstimulating diet the craving for drink weakens, and if continued sufficiently long it disappears, but reappears as soon as meat and irritating foods are again eaten.

The Salvation Army in some of its homes for inebriates has also adopted this diet with good results. At a public gathering in England, Staff Captain Hudson, matron of the South Newington Inebriates' Home, in relating her experience in the treatment of cases, said:

Speaking generally, the benefits of this diet are incalculable. Lazy, vicious, bloated, gluttonous, bad-tempered women, who had hitherto needed weeks and even months of nursing and watching, to my astonishment and delight, under this new treatment, made rapid recovery.

The majority of the Japanese live chiefly on rice and fruits, and they undoubtedly possess the best dispositions to be found among any people in the world. On the streets of Japan fighting and quarreling are seldom seen, and drunkenness is said to be unknown. Courtesy and ceremonious manners are as prevalent in rice-eating Japan as grumbling and beer-drinking are in beef-eating England.

Overeating is another cause of drunkenness. The confession anciently forced from the lips of parents, "This our son is stubborn

and rebellious, he is a glutton and a drunkard," explains the intimate relation that exists between overeating and drunkenness.

It is generally recognized that two-thirds of the food consumed by the average civilized man would sustain him well; the remaining one-third is therefore superfluous and forms food for bacteria. The poisons produced by fermentation and putrefaction serve to irritate and disarrange the organs of digestion and, when absorbed, the nervous system. Nothing will afford relief so quickly or so effectively as will alcohol. Naturally overeating leads to drunkenness.

A great variety of even wholesome food when taken at the same meal cause similar symptoms. Both nature and science teach that the digestive organs are capable of digesting well one or two simple foods, but when, as is often the case, potatoes, cabbage, milk, butter, puddings, fruit, pastry, etc., are taken at the same meal, indigestion, fermentation, and autointoxication are sure to result. By the putrefaction of protein in the colon toxins are formed which tend to increase the blood pressure and produce neurasthenia. This explains why neurasthenics seek for something to decrease this nervous tension; this something they discover in alcohol. In my practice I have found hyperchloridia and neurasthenia usually associated, and yet it is customary to place such cases on a meat diet. This is no doubt one reason why it has been so difficult in the past to help the neurasthenic. The protein combines with the acid and for a time affords relief from local irritation, but the urates and other extractions serve to stimulate the production of gastric juice. That which temporarily palliates permanently intensifies the hyperchloridia and neurasthenia and also the desire for drink.

Hypochloridia also leads to alcoholism, for the one who has constantly dealt out to his body the narcotics and irritants formed in his alimentary canal in small quantities from putrefaction and fermentation of foods is as truly cultivating a craving for alcohol as though he habitually partook of small doses at stated intervals. The only difference is one is fortunately unconscious of what his system craves, the other unfortunately is not. The hypochloridic eats freely of sugar, potatoes, etc., and forms the alcohol within his body; a change of diet upsets him as badly as the one who has been accustomed to taking small doses of alcohol when deprived of it.

History furnishes evidences that among the races of people freest from alcoholic excesses such luxuries as tea, coffee, meat, and cane sugar were rarely if ever used, and complicated mixtures were unknown; that they derived their nutriment chiefly from the non-stimulating and nonirritating products of the earth served in the most natural way.

The reason why the desire for drink is confined to the human family is that among all creatures, aside from man, a simple diet is the rule. The horse is content with his simple meal of unseasoned oats; no mustard or pepper or even sugar need be added to give him a relish for his hay. The horse as a consequence craves no drink aside from water. If civilized men exercised the same good sense in their eating, there would probably be as little desire for alcohol among them as there exists among horses.

The inebriate must be taught what to eat and how to eat. This can be best done in homes established for the treatment of such cases.

Starch is an essential food element and is widely distributed in nature. But the free use of soft starchy foods, and improper mastication, are causes of drunkenness, since they favor fermentation and auto-intoxication. Starchy foods must have incorporated with them saliva. This necessitates prolonged retention in the mouth or thorough mastication.

The free use of liquids with meals is also responsible for digestive disorders and fermentation. Of all creatures, man alone drinks with his meals. Drinking with meals is wholly unnatural. Nature designs that the food should be moistened with saliva, not with drink. Drink dilutes the small amount of saliva that may by chance have come in contact with the food while gliding through the mouth, and also dilutes the gastric juice, and therefore delays digestion of both the starches and proteins and favors fermentation and putrefaction.

Condiments also create a desire for narcotics. Because food is bolted and not allowed sufficient time in contact with the nerves of taste located in the mouth to derive satisfaction from its delicate and natural flavor, pronounced artificial flavors have to be added which will give an immediate twist to the palate. This has led to the use of pepper, mustard, and the free use of salt and sugar, and other substances which irritate the stomach. These help to create and keep up the thirst for narcotics.

Professor Metchnikoff says "the human system is poisoned in no way so frequently as by the innumerable microbes which swarm in the large intestine." Recognizing the evils resulting from the formation of these poisons in the colon, by the action of this innumerable host of microbes, he finds fault with man's construction. He says "this organ is not only useless in man's present state, but positively harmful," and predicts that in the future it may be successfully removed with advantage to the individual. "Man," he says, "is very far from being perfectly constructed." The difficulty, however, lies in man's inventions and not in his construction. So long as man continues to make errors in the selection of his food he will cultivate bacteria and the poisons which create a thirst for narcotics.

Hufeland, the eminent German physiologist of a century ago, discovered this relation between certain foods and autointoxication. He said:

Animal food is more liable to undergo putrefactive changes in the alimentary tract, while substances of the vegetable kingdom contain acid principles that retard our mortal enemy, putrefaction.

Cheese is not a suitable food. While it contains desirable elements, these have associated with them irritants and other undesirable substances. It is not only difficult to digest, but it contains bacteria in large numbers, and aside from this it is a product of putrefaction. Like meat, it creates irritation or thirst, which it is difficult to quench with water.

The free use of butter retards digestion and favors the cultivation of bacteria and the formation of butyric acid. Butyric acid acts as a local and general irritant. The oil in nuts or olives is preferable to butter or any other animal fat, since they are free from bacteria and do not ferment readily.

The aim in diet, especially for inebriates, should be to make the intestinal culture media as unfavorable as possible for the existence and propagation of dangerous bacteria, or to secure as far as possible

an aseptic or sterile condition of the alimentary tract. The foods which are best suited to bring this about are the simple grains, nuts, and fruits, taken in their most natural state. Grains may be prepared in various ways to make them easier of digestion, but the fruits and nuts require no preparation aside from mouth preparation.

The food question when given the attention it demands by physicians, ministers of the gospel, and temperance advocates will not only remove the existing desire for strong drink, but will result in the removal of much of the crime and domestic unhappiness that at present exists because of drink.

Doctor Wiley, in addressing the American Bakers' Association at Atlantic City recently, said:

Good bread, in my opinion, would help to solve the American evil of divorce. If bakers make good bread and then educate the people to buy it, the great destroyer of domestic unhappiness, dyspepsia, will be removed, and we will hear no more of the divorce problem.

Sydney Smith, many years ago, in a letter to Arthur Kingslake, said:

I am convinced digestion is the great secret of life. Character, talents, and virtues are powerfully affected by beef, mutton, pie crust, and rich soup. I have often thought I could feed or starve men into many virtues and vices and affect them more powerfully with my instruments of cookery than Timotheus could formerly with his lyre. Frequently those persons whom God has joined together in matrimony, ill-cooked joints and badly boiled potatoes have put asunder.

While I recognize there are other side paths leading to inebriety and do not wish to convey the idea that errors in diet are wholly responsible for the drunkenness that exists, I am convinced that dietetic errors are among the chief causes of inebriety, and this being so, the diet question must be given the attention it deserves if we would help the inebriate.

PAPERS RELATING TO THE QUESTIONS OF RESPONSIBILITY
AND THE PUBLIC CARE OF INEBRIATES.

MENTAL RESPONSIBILITY IN ACUTE AND CHRONIC ALCOHOLIC INTOXICATION.

By ALFRED GORDON, M. D., *Philadelphia,*

Professor of mental and nervous diseases in the Jefferson Medical College.

A problem of the greatest importance confronts us when we are requested to determine the degree of responsibility of an individual who committed an illegal or criminal act in state of intoxication with alcohol or other drugs.

In an effort to arrive at the proper conclusion one must naturally consider two possibilities, viz, whether the intoxication occurs in an individual with a preexisting mental affection or without the latter. As it is well known a tendency to all sorts of excesses is not an infrequent accompaniment of various psychoses. A similar tendency is observed also in epileptics, in individuals with physical and mental stigmata of degeneracy. Finally, excesses are committed sometimes by persons totally free from hereditary or acquired abnormal stigmata.

It should be equally taken into consideration the fact that illegal or criminal acts are committed not infrequently by individuals whose intoxication is quantitatively not excessive, but on whom small and even minute doses of intoxicating elements produce such an effect as to develop dangerous impulses. This is seen, for example, in some neuropaths, imbeciles, feeble-minded, etc.

With these preliminary remarks, let us first consider the question of responsibility in intoxication with alcohol.

Alcoholism may be acute and chronic. To the latter belongs also a special form characterized by an episodic irresistible desire to absorb alcohol. It is known under the name of "dipsomania."

The mental phenomena of acute alcoholism are, briefly, as follows: The individual experiences at first a sense of "well-being" and of abnormal vigor. His ideas appear to him to be clear, he finds no obstacles, everything appears to him easy, his physical and intellectual force appear to him invincible. The faculty of speech is extraordinarily good, and the most morose becomes loquacious. Soon, however, the reasoning power becomes obnubilated. The phase of depression sets in. Consciousness is clouded, the will power disappears, the instincts predominate. At this stage abnormal and irregular acts or crimes may be committed.

When the intoxication is more profound, delirium and hallucinations with their familiar picture develop. When an acute intoxication occurs in an epileptic, in a neuropathic individual, the above phenomena are still more pronounced. Epileptic seizures are frequently brought on by acute intoxication. A delirious state of unusual severity or acts of violence may follow an absorption of

small amounts of alcohol in neuropathic individuals. In individuals previously insane a drink of alcohol may be the exciting cause for intensification of delusions, for sudden violent acts of the most brutal nature.

Chronic alcoholism, according to some, must follow frequently repeated acute attacks of intoxication. While this may occur, it is not always the case. Most frequently we meet with individuals who are never drunk in the proper sense of the word, but regularly absorb small amounts of alcohol at various intervals, two to three times daily, for months and years. These are the cases in which a chronic poisoning of tissues, organs, humors is established by gradation. Clinically alterations of various functions, anatomically proliferation of connective tissues followed by degeneration of superior elements are observed.

It is superfluous to enter into a detailed description of the material changes which various organs undergo. They are too well known to dwell upon. Suffice it to mention that the most serious consequences are observed in the cranial cavity. Thickening of the meninges, irritation and degeneration of the noble elements of the brain are very common. The cerebral arteries undergoing profound changes, easily rupture under the influence of a slightest traumatism or even spontaneously. Hemorrhages and suspension of cerebral function are the result. Besides hemorrhages, the cerebral circulation is always retarded because of the diminution of the arterial caliber, the cerebral tissue is disturbed in its nutrition, and the functions naturally suffer.

A chronic alcoholic individual is always predisposed to attacks of meningitis, to deliria. An intervening illness of any nature, a slight traumatism, are apt to provoke in him various sensory disturbances, hallucinations in the sphere of the special senses. The picture of delirium tremens is well familiar to us all.

The profound anatomical changes developing gradually in cases of chronic alcoholic intoxication lead to a gradual deterioration of cerebral functions. The latter grow parallel with the degree of intoxication, but depend also upon the idiosyncrasy, heredity, and the make-up of the individual.

Amnesia for certain special subjects or else of a more generalized character, irritability, susceptibility, outbreaks of anger, are the initial symptoms. Later on the patient becomes indifferent, loses all affection for the near and dear ones, becomes hallucinatory, illusional, delusional. The oncoming dementia is the fundamental feature of any of the periods of chronic alcoholism, and during any of its phases the most peculiar acts and crimes may be committed. Such is the mental status of individuals who consume regularly and daily frequently repeated doses of alcohol and at the same time consider themselves free from intoxication. This fact is frequently overlooked and misinterpreted.

A variety of chronic alcoholism, called "dipsomania," presents a very important chapter from the medico-legal standpoint. It is characterized by paroxysmal imperative desire for alcohol, coming on sometimes at regular intervals. This desire is so morbidly intense that the patient is unable to resist and at all price he must satisfy his irresistible craving. Crimes have been committed during this state. I know of a married woman, deprived of money by her

husband because of her tendencies, became a prostitute to procure the necessary means for the purchase of whisky. Such individuals should therefore be considered insane.

Having briefly considered the three main possibilities of alcoholic intoxication and the mental condition of individuals affected with each of these varieties, let us take up the crucial question of responsibility. Otherwise speaking, we are to consider under what circumstances the author of an illegal act or of a crime is or is not responsible for the committed act.

First of all we must exclude from our consideration cases with preexisting mental affections in which a tendency to alcoholic or other excesses is great. A paretic, a paranoiac, a maniac, may become acutely intoxicated and commit violence, assault, homicide, etc. They can not be held responsible, as their intoxication itself is the result of a morbid irresistible impulse created by a deranged mind.

When an individual free from mental diseases abandons himself to drink and during the state of acute intoxication commits an illegal act, should he be held responsible?

Here two possibilities may occur. Either the individual, premeditating a crime, voluntarily and intentionally becomes intoxicated with the object of finding an excuse, or else the crime was committed by an individual without premeditated intoxication. In the first case the individual was well aware of the consequence of intoxication, and he certainly knew from his previous personal experience and from observation of others that acts of violence are frequently committed when in a state of intoxication. Such an individual is totally and fully responsible for his acts.

On the other hand, an intentional intoxication may occur in neuro-pathic individuals, in feeble-minded, in imbeciles, in epileptics, and in individuals suffering from obsessions and various morbid impulses. A question naturally arises: Should we consider totally responsible a person who all his lifetime presented evidences of an abnormal mentality, although not, properly speaking, insane, evidences of arrested development or other deviations from the normal—if such person, I say, by reason of some insignificant grudge, anger against a friend, a neighbor, a relative, will conceive the idea of revenge, become intoxicated, and commit a crime—should we consider him or her entirely responsible?

It is true that whether the delinquent is a degenerate or not, society has the right to protect itself against criminals, but has it the right to protect itself with the same means against everyone without endeavoring to find out if among them there are diseased individuals? Has it the right to get rid of all offenders by sending them pell-mell to the electric chair or to prison for life, by inflicting punishment only because of their nocivity and a certain degree of danger, without taking into consideration the state of their mental health?

Some will say, "When a dog is enraged, kill it; when a man commits a crime, hang him; there is no use for society to waste its energy and means in taking care of criminals." We physicians have always been from time immemorial protectors of afflicted humanity. It is our duty to protest against such a utilitarian spirit and to protect diseased individuals against indiscriminate and wholesale sacrifice.

When an epileptic individual commits a crime during a seizure, he is totally irresponsible. But when the same inveterate epileptic, whose cerebral convolutions are continuously in a state of irritation, commits an illegal act in the intervals between the attacks, when he certainly knew very well what he was doing, can he be considered totally responsible?

Individuals suffering from obsessions, phobias, from folie de doute, délire du toucher, from abulia or deficient inhibition, individuals presenting all forms of deviation from normal cerebral functions, the so-called peculiar, eccentric, queer, without being insane in the proper sense of the word, individuals who present an arrested mental development of all degrees and forms from simple backwardness to the low grade of imbecility—all these are persons whose psychic make-up can not be considered normal and at the same time not morbidly deranged; they can not, therefore, be considered irresponsible and at the same time are not totally responsible. They form the intermediary class, to which Grasset has luckily applied the term "demifous." Their responsibility also occupies an intermediary place and is only limited. This is a clinical observation which can not be denied and the objection of some that one can be only either totally responsible or totally irresponsible can not hold ground before an everyday clinical fact.

Régis has recently said:

Mankind unfortunately can not be divided from a psychological standpoint into two distinct categories, viz, on one side mentally sane or totally responsible and on the other side insane and totally irresponsible. Between the two there is a large province, so-called intermediary zone, populated by individuals tainted in various degrees and consequently presenting very different degrees of responsibility. Although it is impossible to measure the latter by millimeters, it is nevertheless possible to establish for them from this standpoint an ascending or descending scale and consider quite precisely three progressive degrees, viz, slightly, sufficiently, and very largely limited responsibility. The application of the principle of limited responsibility in practice is very important for the expert, because a very large number of cases that are submitted to him for an examination present the incomplete and intermediary pathological states spoken of above, which can not and do not correspond to absolute mental responsibility, but only to a limited responsibility.

Limited responsibility therefore is not a subterfuge of an expert, but a scientific fact established upon scientifically accurate observations.

Now, if independently of acute alcoholic intoxication an individual presents the qualifications for an incomplete responsibility, it stands to reason that he should be considered as such when he commits an illegal act in a state of acute intoxication.

Let us now turn our attention to the question of responsibility in chronic alcoholism.

As we have seen above, there are various degrees of intoxication, but in all of them the predominant feature is the progressively developing mental enfeeblement; the sum of knowledge is gradually being reduced, the disturbance of memory is visibly manifest, and the total circle of ideas is getting more and more narrow; the reduced mental operations are, however, sometimes masked by certain emotional reactions which apparently supplement the psychic deficit in a fictitious manner. What characterizes particularly this mental state is the gradual and progressive disappearance of the faculty of discrimination, and this precisely constitutes a very important factor from the standpoint of responsibility.

Criminal acts are therefore to be expected. If not all individuals have a criminal record, the majority are in a state of imminent criminality. Once a crime committed, the act is frequently repeated. Recidivism is therefore an important element in the study of the problem. Chronic alcoholic individuals fill our prisons and reformatories, as they are considered before courts of justice as vicious and incorrigible delinquents, but in reality they are not less diseased than many other lunatics. It is only exceptionally that some of them are recognized to be insane, but the majority are considered only criminals when they are caught in an illegal act. That criminality is enormous in chronic alcoholics, it is sufficient to mention Baer's statistics in Germany, where out of 32,857 convicts 30,041 are chronic alcoholics. According to Forel (International Penal Congress, 1905, vol. 1) chronic alcoholism is the cause of the majority of crimes and it is a disease of the brain. Heilbronner (*Die akuten Geisteskrankheiten der Gewohnheitstrinker*, 1901) says that some chronic alcoholic individuals who are apparently without manifest psychic disturbances are from the ethical and moral standpoints not superior to early paretics. Cramer in his treatise on legal psychiatry says that the state of degeneration to which chronic alcoholism leads should be considered as a diseased condition and therefore excludes free volition. When we take into consideration the fact that chronic alcoholism is accompanied by an intellectual deficit, lack of volition, affective anæsthesia, moral perversity, suggestibility, automatism, impulsiveness, all symptoms which we meet in various psychoses, we are forced to admit that a pathological mentality is the fundamental feature of chronic alcoholism. These arguments, I believe, are sufficient to solve the problem of responsibility. The conclusion forces itself upon us that a chronic alcoholic individual is a diseased individual, and therefore can not be held responsible for his acts. Recidivism, which is so characteristic of such cases, proves that it is a veritable constitutional disease. A question naturally arises whether the chronic alcoholics at all stages should be considered irresponsible and whether degrees of responsibility are not to be considered. Mental degeneration in such cases is of course a progressive process and dementia develops gradually. Consequently a person with a mild degree of mental enfeeblement can not be looked upon as identical with a person whose mentality is much more deteriorated. While this contention is correct, nevertheless the principle remains intact, viz, that in both cases or rather in all cases of chronic alcoholic intoxication the individual is a patient requiring medical supervision, a patient that is liable to commit illegal or immoral acts, and that chronic alcoholism is a veritable disease.

When we consider dipsomania from the standpoint of responsibility, we encounter some difficulty. The dipsomaniac in the early stages of his infirmity presents apparent lucidity of mind and control of his faculties during the intervals between the attacks of irresistible craving for drink. As dipsomania is always the result of a chronic use of alcohol, a gradual deterioration of cerebral functions becomes evident in its later stages, as we have seen above in describing the picture of chronic alcoholism.

Whether in the early or later stages of this affection, dipsomania per se is a disease; an impulsive act of any nature which the individual thus affected is absolutely unable to resist and of which he

can not give a proper account is certainly a pathological phenomenon. Dipsomaniacs, therefore, are diseased individuals in whom mental responsibility can under no circumstances be considered complete. The degree of the latter depends upon the stage of the disease. It will be limited in the early phase of the affection or when the latter occurs in neuropathic individuals. In this case the individual's power of reasoning is sufficient for a realization of the criminality of the act, but being affected by a malady which interferes with his normal life, although paroxysmally nevertheless sufficiently strong to obnubilate his mental horizon, such an individual can not be considered totally responsible. This remark is particularly applicable to neuropathic individuals who, as we have seen above, are not insane in the proper sense of the term, but present a special make-up of the nervous system which deviates from normal. Dipsomaniacs in an advanced period, when enfeeblement of mental faculties, viz, dementia, is evident, no matter how mild the latter may be, are and should be considered totally irresponsible for their acts. In this case a crime committed in the intervals between the paroxysms is done by an individual whose power of reasoning and discrimination is lessened or perverted, whose inhibitory power is therefore lessened, and such an individual is unable to appreciate the enormity of a crime; he is therefore insane.

INTOXICATION WITH OPIUM AND COCAINE.

In my study of 171 cases of morphinomania and cocainomania, published in the Journal of American Medical Association, 1908, a detailed account of the mental status of such individuals is given. I considered there the psychic phenomena of acute and chronic intoxications with each of these drugs, of mixed intoxication, also the manifestations accompanying abstinence. On a whole the acute and chronic states resemble those of acute and chronic alcoholism. Here and there we find, generally speaking, the delirious, confusional, and stuporous conditions, with or without hallucinations, characteristic of the acute period of intoxication. Here and there we observe the gradual mental deterioration, viz, dementia, characteristic of chronic intoxication.

The special phenomena referable to cocaine consists, as seen from my study, of peculiar tactile hallucinations which are usually not encountered in alcoholism. Another peculiarity worth mentioning is the observation that out of 52 (among 60) acute morphia patients who have totally recovered, 32 presented for weeks mental disturbances; they showed slowness of thought and difficulty of grasping complicated subjects; questions had to be repeated a number of times before they could comprehend them; there was a striking mental fatigue. Among the patients acutely intoxicated with cocaine some for six subsequent weeks suffered from insomnia, vertigo, and attacks of delirium, and one of them was unable to resume his occupation of office clerk for six months because of deficient memory and inability to solve the simplest mathematical problems. In the chronic form of intoxication the moral sense suffers profoundly. The patient loses the sense of obligation to his family; he loses affection for his children, becomes egotistic. The will power is deficient. Excesses of all sorts are common; deception and crime are frequent.

Dementia is the usual outcome of chronic intoxication. In my series of 70 morphia cases it was particularly marked when delusions and hallucinations were absent. In the cocaine cases the special hallucinations mentioned above were more pronounced in the chronic than in the acute form; they lead to formation of delusive ideas which are mostly of persecutory nature. A progressive decrease of intellectual force is also observed in chronic cocaineomania.

The phenomena of abstention I studied in 31 cases. The picture of extreme suffering was complete; the patients were restless, full of anxiety, agitated, and incapable of listening to others, of following a conversation, of reasoning, or of reflecting. Delirium and hallucinations were sometimes present; when they occurred their manifestations were more violent than in delirium tremens. When abstention was practiced in advanced cases with signs of dementia, no improvement in the mental condition was noticed. A gradual withdrawal of the drug or drugs produced besides anxiety also a state of depression.

When we compare these mental disturbances with those of alcoholism we find great analogy, if not identity.

The problem of mental responsibility in morphine and cocaine intoxications is practically that of alcoholic intoxication.

When a criminal act is committed by an individual who, being under the influence of acute intoxication with morphine and cocaine is in a delirious state and has hallucinations, who is then incapable of distinguishing between right and wrong, whose cerebral functions are in a state of dissociation, can he be considered responsible for his acts from a medical standpoint?

Cases with preexisting mental affections in which a tendency to excesses and to the use of drugs is great must naturally be excluded from our consideration. In such cases the intoxication itself is the result of a morbid impulse caused by the insanity. These patients can not be held responsible when they commit a crime while under the influence of the intoxication.

Outside of this possibility the discussion elaborated apropos of the question of responsibility in acute and chronic alcoholic intoxication is entirely applicable here.

When an intentional intoxication occurred for the purpose of committing a crime, the responsibility is complete.

When intoxication occurs in neuropathic individuals, for the reasons elaborated above the responsibility is only limited. The latter should also be accepted when the patient has recovered from the immediate effects of acute intoxication, but remains for weeks, as I have shown in some of my cases, mentally dull, apathetic, with lack of sustained attention and difficulty of comprehension.

In the chronic form of morphinism and cocaineism similar to chronic alcoholism mental degeneration and subsequent dementia are of a gradual but progressive nature. A person with a mild degree of mental enfeeblement can not be considered as identical with a person whose mentality is much more deteriorated. Consequently the impairment or disappearance of the moral sense, deficiency of the will power, and even a mild diminution of intellectual faculties do not entirely exempt a morphine habitué from responsibility; the latter is only limited. When, on the other hand, delusive ideas or hallucinations are present, the irresponsibility is total.

When the patient reaches the stage of dementia, even in the absence of delusions, he can not be held responsible for any of his acts.

In conclusion, I wish to emphasize the object of the present study. It is a very well-known fact that in a great many instances the medical and legal conceptions of insanity and responsibility are not in accord. The legal requirement of the test of right and wrong as the only means of determining the criminal's responsibility or irresponsibility is inadequate and does not conform with our present scientific knowledge. To harmonize the legal and medical views and to find a compromise between the two apparently antagonistic fields is, I confess, a difficult problem. This subject is of a vast practical importance and will form the basis of a special study at some future time. In the present essay I have considered exclusively the medical aspect of mental responsibility. I have endeavored to show by means of accurate scientific observations, experimental, pathological, and clinical, that when in presence of an antisocial act one must ask oneself if the individual having committed it was capable totally or only to a limited degree to understand the importance of the act; if he could appreciate all the consequences; if he has not undergone some predominating morbid influence; shortly speaking, if he was scientifically responsible or irresponsible irrespective of legal difficulties or intricacies.

Criminality is a phenomenon of social pathology and must therefore be studied from the standpoint of biological sciences.

THE MEDICO-LEGAL CARE OF ALCOHOLIC DEFECTIVES.

By G. ALFRED LAWRENCE, LL. B., Ph. D., M. D., *New York,*

Instructor nervous and mental diseases, New York Postgraduate Medical School, visiting neurologist City Hospital, etc.

The proper care of the thousands of men, women, and children who annually succumb to the overpowering influence of the alcoholic habit, which holds so many of them in its relentless grasp until death terminates the scene, is becoming a serious problem, not only from the medical and legal standpoint but also from the social, civil, and economic aspects of the case. The enormous sum of \$1,325,439,074 was spent during the year 1905 in the United States for liquor, and a vast army of incompetents, numbering 1,500,000 men and women, were daily incapacitated for work during that same period, making a total cost of over \$3,000,000,000 for and from the direct effects of alcohol to this nation alone. England spends nearly a billion dollars annually in drink, and if we added up the total expenditures of all the nations of the earth for alcoholic liquors, with the additional cost to these nations from the effects of the stimulant, the wealth of even a modern Cræsus would seem but a mere bagatelle in comparison. Yet with such statistics on record the legislature of the great Commonwealth of New York, the Empire State of the Union, last year failed to pass a bill for the appropriation of a paltry \$15,000 for the purpose of creating a commission to study the treatment of inebriates and persons addicted to the excessive use of narcotics and their relation to the commission of crime and, furthermore, of establishing a state institution for the care of such persons, the members of the commission to serve without salary and the above sum to be expended only for the expenses of the said commission. This bill failed of passage on the ground that the State did not have the necessary money to devote to such a purpose!

Alcoholics requiring medico-legal care from an etiological standpoint may be divided into three general classes:

(1) Cases having a defective heredity, as alcoholism, syphilis, tuberculosis, some nervous or mental disease, etc., in one or more ancestors. These are not only the least promising but the least amenable to care and treatment.

(2) Cases initially healthy and with good heredity, but acquiring some severe, organic, or functional disease, as syphilis, tuberculosis, cancer, a neurosis or psychosis, and afterwards becoming addicted to the alcoholic habit. This class is of greater promise, but many fail of permanent cure.

(3) Cases of good heredity and free from any acquired disease, but who drink to excess. These cases are most amenable to treatment, and a larger percentage can be permanently cured if treated for a sufficient length of time and in a suitable environment. In all three of these classes we may have acute, subacute, or chronic forms of alcoholic psychosis or defective mental states, requiring medico-legal care. Statistics show that some 55 per cent of all cases of alcoholics if properly treated may be cured. If the habit results in an actual insanity, care in either a public or private hospital for the insane may be necessary during the period of complete mental alienation. This period, however, may continue only for a very brief time, and if the patient makes the demand he must be liberated as soon as mental alienation ceases, and only too often goes forth before he is really capable of properly caring for himself, with diminished resistive force, to again fall victim to his alcoholic habit. When such cases reach a condition that permits them to leave the insane asylum, they—with those cases in which mental alienation is not complete, but there is an inability to control the morbid desire for drink, so that they may become an economic burden to their family or to the State, a violator of the law, etc.—should be legally committed for care and treatment to some colony for inebriety and there remain until such time as the superintendent and his staff (who should all be expert inebriatists) consider that the patient is cured and capable of again going forth into the world and assuming all the necessary obligations of a useful member of the body politic. Such a colony should be situated near a great center of population, and easily accessible. In some of the larger States, as New York, Pennsylvania, and Massachusetts, several such colonies could be maintained at a great economic saving to the Commonwealth. A colony of this character could be partially self-supporting by the sale of farm and garden produce and the products of various industries, that could be maintained by the labor of the alcoholics supervised by a very small staff of paid employees. Such a colony should have a large tract of arable land with some woodland, so that various crops, vegetables, dairy products, and timber or wood might be obtained. Workshops or special factories should be erected where upholstering, wood carving, leather and metal work, basket and rug weaving, pottery and clay modeling, harness making, blacksmithing, carpentering, stenciling, printing, bookbinding, and various other forms of handicraft might be carried on by the alcoholics acting as farm hands, dairymen, artisans, messengers, orderlies, clerks, attendants, and helpers of various sorts. Centrally located should be an administration building, a hospital, an amusement hall, with stage for theatricals, billiard and pool tables, reading room, and gymnasium, the latter containing a swimming pool, bowling alleys, hand and tennis courts, etc.

Suitably arranged about these central buildings, and upon a detached-cottage place, groups of small dwellings should be erected, each to accommodate from 10 to 30 patients; practically the entire care of these cottages could be left to the patients who occupied them. The sexes should be separated and occupy different parts of the colony with the exception of coming together for dances, entertainments, and religious services. This detached-cottage plan

would permit of a suitable classification of the various forms of inebriety. A church for religious services and laboratories for scientific research should also be erected.

A medical superintendent with an adequate staff of physicians, all skilled inebriatists, should carefully examine every case admitted to the colony, secure a complete history of the same, and keep an accurate record of his condition during the entire period of his residence, classifying him, directing his treatment, and selecting a suitable occupation as best adapted to the particular skill or training of the individual. All cases sent to such a colony should be under legal commitment, so that the medical staff can have the proper authority to direct the treatment of the patient along the lines best adapted to the individual need of the case and for a suitable length of time. This system of colony care of inebriates would be a much less economic burden to the State than the vast economic waste that now goes on from the lack of proper restraint of this rapidly increasing class of unfortunate defectives. As an illustration, of the 2,593 inmates of the New York City almshouse, 90 per cent are there through drink and are a complete economic burden to the city, whereas if placed in such a colony many could do some work, and thus partially pay for their care. That such a colony could be self-supporting is borne out by the reports of the Craig colony for epileptics at Sonyea, N. Y. In this very successful colony, consisting of over 2,000 acres of farm and woodland, there are some 1,200 epileptics many so defective as to be unable to do anything, and yet in 1906 the produce from their farm, garden, and numerous industries reached the total value of \$42,000, and practically most of the work was done by the patients. The maintenance of such colonies near great centers of population and conducted along the general lines above indicated would be a distinct step in advance in the care of this continually increasing class of defectives, and would be of material economic saving to the nation in conserving wealth, diminishing crime, and improving the general health.

THE RELATION OF THE PAUPER INEBRIATE TO THE STATE FROM AN ECONOMIC POINT OF VIEW.

By LEWIS D. MASON, M. D., *Brooklyn, N. Y.*,

Vice-President of American Association for the Study of Alcohol and other Narcotics.

Public sentiment is comparatively easily interested in the epileptic, the consumptive, the pauper, the orphan, the sick and aged, the insane, the idiot, and the feeble-minded, and those deprived of the use of organs of sense.

Hence colonies, hospitals, sanitariums, almshouses, educational and industrial institutions are organized and sustained largely through a sympathetic influence acting on public and private benevolence; nor do we exclude the claims of public necessity, nor fail to apply the principles of economic administration in the care of such cases.

We recognize the imperative fact that the criminal must also be cared for, on the ground of public necessity and absolute protection for the community.

Society must be safeguarded against the vicious, the malicious, and criminal classes.

Whatever the character of the institution or colony may be, whether eleemosynary or penal, economy must enter into the consideration of the case of the unfortunate or vicious classes of society; and the problem eventually resolves itself of necessity into one of finance.

The question is, How shall we do the best we can for these wards of the State at the least possible cost to the law-abiding and industrious portion of the community, the taxpayers of our Commonwealth?

With the inebriate it is different. The public look upon him as the voluntary subject of a vice, and will not realize the fact that we are dealing with an irresponsible class who, at least in a large measure, have passed beyond the limit of responsibility, and a class from which the degenerate and criminal classes are so largely recruited, and from which originate, in a great measure, the criminal, the pauper, the sick, and the insane that fill our penal and charitable institutions.

Public sentiment has dealt with the inebriate in a foolish, irrational, and extravagant manner, and not with the common sense that it has applied to all other classes. Social law and order has passed by the inebriate, refused to properly classify this species of the genus homo, simply regarding him as a social outcast and decidedly as a "persona non grata." He was the social problem of the past; he is the social problem of the present; he will be the social problem of the future, unless a modicum of common sense is exercised in regard to his care and control.

It is true that the moralist and the reformer by threats attempt to frighten him into sobriety, or by kindly acts and the instilling of hope try to lead him to a better life.

The law brands him as a criminal, and punishes him by fine and imprisonment, while public sympathy and interest may be totally indifferent or divided between the reformer and the law, as a rule the preponderance of sentiment being in favor of the latter.

It is the old story, a "twice told tale" with which you are perfectly familiar. You can not secure for the inebriate either public interest or legislation, which, after all, is public sentiment in the concrete, along the usual lines that affect other social conditions. Such efforts will fail as far as the inebriate is concerned.

Therefore those who are interested in the welfare of the pauper inebriate—for my remarks have principally to do with that class—will waste their time and energies if they plead along sympathetic lines only. I do not mean that a plea on a moral, spiritual, or humane basis will not arouse a Christian public. But when you face the average taxpayer, or the "committee on ways and means" of a legislative body, an argument based on moral, spiritual, or humane grounds would simply fail. The only argument you can bring forward that would be effectual under these conditions is one based on financial considerations and on dire and urgent public necessity. You must appeal as a political economist and show by fact and figure that which is good business policy and that money is saved to the State or municipality, and consequently to the taxpayer.

The most powerful appeal that you can make to the average taxpayer is any plan that will lower the prevailing tax rate; and therefore if we are at all interested in the inebriate, and desire action on his behalf, and are wise, we will approach the public as taxpayers, and then by force of public sentiment, thus enlightened by facts and figures, and stimulated by self-interest, compel favorable legislation on behalf of the inebriate. In fact, this is our only resource. But the public must first be interested. The demand for economy must have always come first from a tax-ridden public. Economy, as a rule, does not begin with legislators. Public sentiment must, as it always has, compel legislative action in any direction. With these prefatory considerations let us consider the relation of the inebriate to the municipality and the State from an economic point of view.

We can readily demonstrate that the present method of dealing with the pauper inebriate is nonpunitive, nondeterrent, nonreformatory, rather the reverse, not checking, but promoting intemperance, pauperism, disease, and crime, and all their attendant and secondary evils, and, besides, all this is enormously expensive.

The public and the legislators, who but reflect public sentiment, are laboring under a delusion; in their own inner consciousness they have worked out, as they think, the whole problem of inebriety, but their conclusions are erroneous because their logic is faulty and based on wrong premises, and therefore the ultimate end of their deliberations worse than useless.

Let me again call your attention to and emphasize the fact that inebriety is the fertile source of crime, pauperism, insanity, and disease. At least four-fifths of the criminals and degenerates of a community may, according to English statistics, be traced to this cause either directly or indirectly. Facts go to demonstrate that it is an

important factor as a cause of suicide, disease, accident, and adult male death from accident, and either directly or indirectly explains the mortality statistics of our great centers of population, especially among the adult male class, in excess above the normal death rate in an ordinary sober community.

Looking at the financial side of this problem we find that 50 per cent of the municipal expenditure for our police departments is simply for the arrest of the drunken population of cities. Nor does this include the expense of sheltering and caring for same in prisons, penitentiaries, and almshouses, or other corrective or charitable institutions, one-third of their inmates on an average being either directly or indirectly of the inebriate class.

These are some of the direct fruits of inebriety. We garner the fruit, but we do not cut down the tree. We do not go to the root of matters. Nay, our present method promotes growth; we cultivate that which we ought to destroy, and we are rewarded—or shall we say punished?—by an abundant crop of evil, the result of the irrational and unscientific method now in vogue of dealing with the inebriate.

First, then, let us call attention to the manner in which the police department carry out the laws enacted by our legislators and administered by our magistrates; laws which deal with the inebriate in a most unscientific, irrational, and expensive manner; laws which the legislature have passed, but for which the public who elect them are primarily responsible, and the genesis of which is a fundamental error as to the nature of inebriety and proper methods for the care and control of the inebriate.

Let me point out the fact that arrests recorded on the police blotter are cases, not individuals. Thus, if 10,000 cases of arrest for drunkenness are recorded, we find it may represent certainly one-half or even less of individuals. In an article entitled "The pauper inebriate—cases versus individuals," read and published in 1897, we pointed out this glaring discrepancy, quoting from the experience of others on this subject, and particularly from an article published some years previously by my father, the late Theodore L. Mason, M. D., on this subject, entitled "Inebriety a disease."

In the "report of the advisory committee on the penal aspect of drunkenness," appointed by the mayor of Boston, 1898, the following statistics point out this evil:

Former commitments of prisoners committed for drunkenness to all penal institutions in Massachusetts for the year ending September 30, 1898.

	Number.	Per cent.
Whole number of commitments.....	20,222
Number of first commitments.....	8,794	43.46
Total recommitments.....	11,439	56.54
Number of times previously committed:		
One time.....	2,113	18.47
Two times.....	2,415	21.11
Three times.....	1,524	13.32
Four times.....	1,021	8.92
Five times.....	816	7.13
Six to fifteen times.....	2,701	23.61
Sixteen to thirty times.....	689	5.58
Thirty-one to fifty times.....	160	1.38
More than fifty times.....	56	.48

Statistics relating to persons sentenced to Deer Island (one of the penal institutions of Boston) showed that there were 8,447 committals for drunkenness, the report stating that "this number represents, however, but 5,444 individuals; consequently 3,003 were for offenses repeated within the year."

It will be noticed that in all the penal institutions the recommitments were considerably over one-half of all the first commitments.

The fact is also evident that where there were longer terms of imprisonment, as at Deer Island, the ratio of recommitments was less than those institutions in which the period of imprisonment was shorter, a fact essentially in favor of the longer term of commitments as opposed to the shorter term.

The Boston statistics also show the relation between individuals and cases, to which we have referred. Thus, 11,439 individuals were recommitted from two to over fifty times each, making at the lowest or minimum estimate a total of over 50,000 rearrests in excess of first commitments, represented by the above number of individuals at various periods during their inebriate career. When we consider that the cost to the city of Boston was \$8 for each case committed, the enormous and useless expense to the municipality is at once apparent. Nor must we forget, in addition to this direct and useless expenditure, this drifting population of drunkards during their life history swelled the records of the many asylums, hospitals, and charitable and penal institutions, under different aliases, and when at large imposed on the charity of an indulgent public, thus contributing in many ways and at all times to the crime, pauperism, and disease statistics of our great centers of population. The following table shows the number of prisoners and the number of times committed according to the statistical report of the department of correction of the city of New York for all causes:

Number of times committed.

	One.	Two.	Three.	Four.	Five.	Six to ten.	Eleven to twenty.	Twenty-one to thirty.	Thirty-one to forty.	Forty-one to fifty.	Fifty-one to seventy-five.
Males.....	10,325	694	143	86	47	187	32	11	26	9	21
Females.....	4,133	670	547	258	240	252	47	4	3	4	4
Total.....	14,458	1,364	690	344	287	439	79	15	29	13	25
<hr/>											
Males.....											11,581
Females.....											6,162
Total.....											17,743

Of these prisoners 5,568 were committed for intoxication, 3,233 male and 2,335 female. We can safely assert that the recommitments, varying from one to seventy-five times, were for intoxication, with or without other misdemeanors, thus equaling if not exceeding the Boston statistics in this particular.

All statistics should have the individual record. It would simplify the record of the police department of our cities if such records would classify individuals as individuals and not individuals as cases. We

would then have the advantage of an individual record, and be able to follow the prison and penitentiary record of the individual in this particular.

The following table will explain itself, and show why the same individual is so often arrested and recommitted during the year. It will be observed that the shortest term, three to five days, tallies almost with the number of prisoners committed for intoxication only:

Terms of commitment of prisoners admitted during the year 1902.

	Three to five days.	Ten days.	Fifteen days to one month.	Two to three months.	Four to five months.	Six months.
Male.....	3,835	2,124	918	1,641	3,052	11
Female.....	1,945	1,601	309	857	1,444	6
Total.....	5,780	3,725	1,227	2,498	4,496	17

Males.....	11,581
Females.....	6,162
Total.....	17,743

Ten thousand seven hundred and thirty-two committed for thirty days or less, and 9,505 of these for ten days or less.

These frequent recommitments for short periods are for repeated offenses by a comparatively few persons during the year, and for intoxication only, or the same associated with petty crimes and misdemeanors, the result of the intoxication.

A little study of these statistics will explain themselves, even to the most casual observer. We will now call attention to the civic cost of drunkenness, and refer again to the Boston statistics:

The cost of drunkenness, and incomes from fines for this offense during the year 1898.

It is estimated that the cost of making arrests for drunkenness in Boston is equal to one-eighth of the total cost (\$1,683,957.97) of the police department; with 26,157 arrests for drunkenness at \$8.04 each, the total cost to the city was.....	\$210,494.74
There were 8,447 committals to the house of correction at Deer Island for drunkenness, and the aggregate of the time served was 459,252 days, equivalent to 1,258.224 years; the per capita cost of maintenance was \$84.70, making a total equal to 75 per cent of the whole cost, or.....	111,212.71
There were 107 committals to the house of correction at South Boston for drunkenness, and the aggregate time served was 13,460 days, equivalent to 36.877 years. The per capita cost of maintenance was \$124.47, making a total equal to 7 per cent of the whole cost, or.....	4,590.08
There were 1,877 committals to the Suffolk County jail for drunkenness, and the aggregate of the time served was 26,097 days, equivalent to 71.50 years; the per capita cost of maintenance was \$184.69, or.....	13,205.33
Total cost of drunkenness, in 1898.....	339,502.86
Income from fines.....	23,490.78
Net cost of arresting persons for drunkenness and maintaining those committed to the penal institutions of Suffolk County in 1898.....	316,012.08

In addition to the direct expense of this class to the municipality we can only refer to the burden which is imposed on charitable organizations and individuals, and the misery, waste, and destitution

which follow on their trail, and which has been enacted under a roving commission practically furnished to them by a nearsighted and extravagant municipal policy, which has inaugurated and sustains the miserable farce of fines and short-term commitments, a constant menace and expense to the community, a method of dealing with this class which we have stated is neither deterrent nor reformatory, but positively the reverse.

The report of the New York department of correction states:

The total number of prisoners committed for the year 1902 was 25,064. The greater part of these, 20,358, were confined in the workhouse, Blackwells Island, and the branch workhouse, Harts Island. The remaining prisoners were in the following institutions: New York County Penitentiary, Blackwells Island, 1,172; Kings County Penitentiary, Brooklyn, 2,534. The population at the workhouse is a constantly changing one, as the inmates, who are only charged with misdemeanors, are committed to serve sentences varying from a few days to six months. The largest number of prisoners last year were committed for the first time, but some have been committed as many as 75 times.

The workhouses received the majority of the committals made during 1902. The statement that the committals range from a few days to six months, and that while the majority were committed for the first time some were committed as often as seventy-five times, is a record that tells its own story, and has short-term committals for intoxication written all over it. It may be mentioned here that the fines collected for intoxication or other misdemeanors in New York State meet a certain proportion of the expense incurred in the board and maintenance of the prisoners in the district prisons, city prison, workhouses, and penitentiary, but were a mere trifle as a contribution to the total cost of arresting and committing the inebriate population of our city.

An unfortunate aspect of the fine system is that in a large number of instances the fine is paid by the industrious, sober, and self-sacrificing portion of the community, and not by the drunkard himself; so that the fine is literally a tax imposed on the family or friends of the inebriate, who, having suffered in many ways for his misconduct, suffer in this respect also.

It may be said that at least one-third of the prisoners in our prisons and penitentiaries are committed for habitual intoxication. This would be a low estimate if we considered alcohol also as an indirect cause of the crimes and misdemeanors for which they were committed, irrespective of committals for that of drunkenness. We submit a statistical table of leading American cities showing the average number of arrests for intoxication in these cities during the year 1902:

Statistics of leading American cities, 1902.

Cities.	January 1, 1903, popu- lation.	Total number police force.	Average annual cost of force.	Average annual number of arrests.	June 30, 1902, average arrests for intox- ication.	Licensed retail liquor saloons.
New York.....	3,682,159	7,707	\$11,566,690	145,164	71,573	10,821
Chicago.....	1,800,000	2,780	3,300,000	75,000	32,482	6,740
Philadelphia.....	1,335,000	2,902	2,500,000	62,000	30,428	1,737
Boston.....	573,879	1,214	1,600,000	39,078	19,511	980

It will be noted that the statistics for arrests for intoxication, also number of licensed saloons, is six months earlier than the other statistics, but the record is near enough to be approximately correct.

It will also be noted that about one-half the total arrests for all causes are for intoxication.

It will also be noted that the number of arrests for intoxication pro rata to each member of the police force is 10 or + 10.

According to the Boston statistics for 1898 it is estimated that the cost of making arrests for drunkenness, irrespective of board and maintenance, was one-eighth of the total cost of the entire police department.

Applying the same ratio to the average annual cost of the police department of cities we can ascertain the exact cost to each city for simply the arrest and committal of its drunken population.

When we ascertain that 50 per cent, if not more, of the average arrests for intoxication are rearrests and recommittals in the same year, we can readily estimate the amount each municipality pays for rearrests and recommittals of intoxicated persons, which, on the above basis, would be one-half of one-eighth, or one-sixteenth of the total cost of our police department of each city.

In other words, if the individual was arrested once annually instead of several times the expense to the city in the arrest of its drunken population would be reduced one-half.

Those interested can apply this statement to the statistics of cities already given.

Thus, New York would have saved in 1903 one-sixteenth of its total police department expenses, or \$722,917, and Chicago, Philadelphia, and Boston a proportionate amount.

We do not estimate the increased expense of caring for short-term prisoners in the prisons and penitentiaries as compared with the greater advantage and less expense of caring for long-term prisoners, nor the fact that short-term prisoners can in no wise be made self-supporting when the term of commitment does not average ten days in the great majority of cases. The whole question then turns on the short-term commitments and the fine system, which practically results in the majority of cases in the short-term commitment of a few days. Abolish this worse than useless system by repealing the laws under which it is carried on and the problem will be solved. We are now dealing with simply a matter of dollars and cents, the financial aspect of the question. We shall refer elsewhere to the iniquity of the short-term sentence and fines, and its pernicious results.

The attitude of the law and the police departments of our great cities toward the pauper inebriate, who constitutes so large a proportion of the class which come under their control, is clearly shown in these statistics.

It will be observed that the total commitments greatly exceed the total first commitments, and average more than one-half of the whole number of commitments for intoxication, and that the total arrests for intoxication constitutes at least one-half of the total number of arrests for all causes; and this percentage applies to all the cities of the first class, whose statistics we have tabulated.

The expense of these unnecessary recommittals in the case of individuals is readily shown, and the number of times each individual was recommitted. According to the Boston statistics the arrest of

single individuals for intoxication varied from 2 to 50 times and over, while according to the New York statistics the number of arrests of individuals varied from 2 to 75 times. We are assured that from 15 to 20 times is not an unusual record in a single police court for the same individual, who may have passed in his inebriate career through several police courts in the same or other cities, and counted in his institutional itineracy for many cases on the blotters of many police stations. It would be extremely interesting to follow the life record of one of these "rounders," or itinerant drunkards, and trace him through our various penal and charitable institutions, and then sit down and count the cost of that single individual to the State and indirectly to the taxpayer, not only from a financial standpoint but from every other aspect that involves pauperism, disease, and crime.

We can not condemn too severely the miserable method under which our police magistrates deal with our drunken population. We refer to the law of fines and short-term imprisonment, a system that manufactures the "vagrant drunkard," the "jail bird," the "itinerant drunkard," or, in the language of the police, "the rounder." No wonder our police courts have been aptly styled "schools of vice."

In an address of the English Howard Association, on the treatment and prevention of crime, they say that the system of repeated short sentences "is intolerable." That—

Repeated sentences of fortnight upon fortnight, and month upon month, add to the difficulties of prison management, and greatly demoralize the delinquents and their companions as a class.

Where a single short sentence fails to deter, it is a proof that public morality and economy alike require the infliction of a longer reformatory discipline, protracted until criminal habits are effectually subdued.

An eminent authority has recently remarked that "magistrates who repeatedly pass demoralizing short sentences are themselves promoters of crime."

Speaking of the evils of the present system the committee appointed to report on the penal aspects of drunkenness in Boston characterizes the method as follows:

In fact, short of a public bounty on drunkenness it is doubtful whether human ingenuity could devise a system which would be as wasteful and demoralizing as the present one.

The same report characterizes the "rounder" as the product of the present method, as follows:

Let no one misunderstand this pitiful wretch—the "rounder," physically and morally debauched, is the product of the existing system. He represents the closing act in a moral tragedy, in which society plays the villain in the guise of justice and law, and the poor man is the victim, with the imprisonment of a hitherto respectable first offender for the first official act in the tragedy; the corrupt and compromising associations of the prison, for the second act; tainted reputation and decreased earning capacity, for the third; discouragement and relapse, for the fourth; and so on to the end of the miserable business—first moral and then physical death.

In further confirmation of these facts I desire to present portion of an article on the care and treatment of inebriates, by the late Rev. J. Willett, superintendent of the Inebriates' Home for Kings County, and published in 1881. He thus writes concerning the "vagrant drunkard" or "rounder," or "prison class" of inebriates:

I only wish we had the means and the machinery at our disposal to take hold of the prison class. I refer more particularly here to those who have been committed and recommitted to prison from one to one hundred times, in order to save them from spending the balance of their lives in revolving from the barroom to the bar of justice, and

from thence to the prison cell. When discharged from jail, ragged and forlorn, they find themselves friendless wanderers in the streets, shunned by every passing stranger. I am aware that the popular cry is "Let them go to work," but who will employ them, when they are everywhere shunned as if stricken by pestilence? Besides all this, they are physically broken down through the effects of bad liquor and starvation prison diet. The majority of their numbers are mere wrecks of humanity, and are regarded as fair game for the policeman to hunt up and chase down for the purpose of swelling the annual return of the arrests made by him, with a view to promotion to a higher grade. On each succeeding recommitment of the vagrant drunkard to the jail, the daily charge for his subsistence goes to swell up the sheriff's board bill, the profits on which in some counties may be safely estimated as more than 100 per cent. Thus the vagrant drunkard is practically reduced to a mere chattel, the legally recognized stock in trade of the police force and his jailers.

But we must not forget that we are dealing with facts and figures, and talking not to the heart but the pocketbook of the taxpayers.

Fifty per cent of all arrests in our great cities are for intoxication, and the arrests of 50 per cent or more of this class are rearrests, often with a few days only between each arrest, so that the same individual is arrested, committed, and released every few days.

The cost to the city of Boston in 1898 was \$210,494.74 for 26,157 arrests, at a per capita cost of \$8.04 each. One-half or more of these arrests were rearrests, retrials, recommitments of persons who had been arrested from two to fifty times each.

The arrests for intoxication in New York City for year ending June 30, 1902, were 71,573, or over one-half of the total arrests; and fully 50 per cent of these were rearrests and recommitments of the same person, who had been arrested and committed from two to seventy-five times each, and this average will pertain to all the great cities and centers of population. It may be said that half the time of the police department of our great cities—its patrolmen in arresting, its police magistrates in committing, its prison and penitentiary officials—is in controlling and caring for persons who are arrested many times during the year. If the drunken population of our cities, the class and individuals who are well known to the police, could be arrested and incarcerated only once annually, the expense of the police department of said cities would be cut down one-half, the business of which is due largely either directly or indirectly to alcohol.

In the recent words of a police magistrate, "Find an antidote for intoxication and one-half of the business of the police courts would vanish," and we would say, shut up the "rounder," the itinerant drunkard, and the problem is solved; which will not only relieve our overburdened police courts but reduce the average tax rate very materially; lessen also the strain upon our various charitable and correctional institutions, which care for the "rounder" under various aliases in his institutional itineracy, to say nothing of the persistent and great demand from which a generous and sympathetic public would be relieved.

The cost of handling the drunken population of Boston in 1898 was one-eighth of the total cost of its police department, or \$210,494.74. Fifty per cent of this expense was for unnecessary recommitments, as has been already asserted.

On the same basis it cost New York City about \$572,584 to arrest its 71,573 cases of intoxication. Fifty per cent of this expense was for recommitments, and was also unnecessary.

This record will grow as our urban population increases.

During the milder seasons of the year our suburban population feel the burden and annoyance of the genus known as tramps, who are simply members of the great army of the drunken population of our cities on its annual pilgrimage. But although this may afford slight and temporary relief for our cities, the question is one for our great civic centers, on whom the care and expense of this class primarily and permanently rests.

You can perceive that the whole aim and drift of this paper is in favor of the long-term commitment, not less than six months in any case, and the accumulative sentence of one, two, or three years in incorrigible cases or repeated offenses.

Long sentences are opposed to the miserable present system of short-term imprisonment, a few days, on the average, in the larger proportion of cases, and the fine, which is seldom paid, and so is practically a short-term commitment.

The "long-term commitment," with a judicious use of the "probation method," as practiced and recommended by the Boston authorities, and the "parole system," as used in our penal institutions and insane asylums, would solve the problem of the civic care of the pauper inebriate and lessen both the state and municipal expenses as to his control.

I can not close this paper without quoting from the following argument in favor of a long-term commitment for the chronic pauper inebriate. This statement is not based on the fact that it is a method of economy alone, but also that it is the only true method of reformation, the only one that can benefit the drunkard. This report was made some years since; and now we advocate separate institutions for the pauper inebriate, isolation, segregation, separation from all other classes that are wards of the State, whether insane or criminal. With neither of the classes can the inebriate be properly placed and be successfully treated. Moreover, the earning capacity of the inebriate is on a better scale than that of the criminal, certainly equal to it, and vastly superior to the average resident of the almshouses or the insane asylum, so that he can under confinement be made to administer to his self-support. With this explanation we submit the article published some years since in a paper written by my father on this all-important subject. As the article gives in a condensed form the points I wish to present and urge, I will ask the privilege to quote it at length:

NECESSITY FOR LONG TERM.

A great deal has recently been written and said concerning the expediency of utilizing the chronic drunkard by establishing workshops in connection with our prisons, in which he may be able to contribute something toward his own support while in custody, and even to lay up a little capital to start with when released at the expiration of his term.

The experience of those thoroughly acquainted with the management of penal institutions is that it is utterly impossible to utilize the drunkard who is constantly being recommitted to the jail or the penitentiary unless, after repeated offenses, he be committed for a term of years. On this important subject we can not do better than to quote from an annual report of Gen. Amos Pillsbury, then warden of the Albany Penitentiary. In speaking of this subject he says:

"It is for the lawgiver to determine whether imprisonment in the penitentiary is the best mode of punishment for intoxication in any case; but if it is designed to have any effect in curing the vice of intemperance, a term of six months should be imposed in all cases of second or further convictions.

"The truth is that nothing short of a direct interposition of Divine power can perform the miracle of suddenly converting and turning men from the error of their ways. Human agencies can only hope to accomplish the work of reform by retaining the subject under their operation until the power of old evil habits shall have been weakened by disuse, and new and good habits of sobriety and industry shall have been firmly acquired."

In a report of the board of state prison inspectors (whose offices have been abolished under the new constitution) we find the following language on this subject:

"For the large class of convicts having sixty or less days to serve, the superintendent can obtain little or no remunerative employment, so much time being required in these cases for the necessary instruction as to leave an employer small prospect of a compensating gain. It follows, as your honorable body will readily perceive, that convicts of this class not only fail to indemnify the penitentiary against the cost of their own support, but become, for the most part, a constant drain upon the productive labor.

"But it must be remembered, moreover, that many of those short-time men are committed to the penitentiary during the year over and over again, deriving themselves nothing whatever from the transient suspensions of their liberty, while inflicting upon the resources of the institution a steadily growing pecuniary loss.

"Besides, this class of subjects make heavy demands on the time and the attention of our physicians, and convert our hospital in too many cases into a place of recovery from attacks of delirium tremens or other consequences of habitual intemperance and evil habits."

The consensus of expert opinion is then in favor of "long-term commitments," "the accumulative sentence," with the judicious use of the "probation" method and the "parole," all of which is diametrically opposed to the present system of "short commitments and fines," which are neither punitive, deterrent, or reformatory, but rather the reverse, as has been said, promoting intemperance, pauperism, and crime, as well as more than doubling the municipal expense in the care of the pauper inebriate.

We submit to the taxpaying and tax-ridden public, and indirectly to our legislators, the proposition: That the money thus worse than wasted in the continual arrest and rearrest of this class could be more properly and satisfactorily spent in the care and control of the pauper inebriate in reformatory institutions, which could be erected and maintained largely by the money so uselessly squandered by the present method, and not only provide for the maintenance and control but the reformation of this unfortunate class. A consummation devoutly to be wished for, but not possible under the present system. And, besides all this, relieve our police magistrates and police force of half their present duties, involved in the ever-increasing burden which the constant arrest and committal of this class entail on our police courts, and also relieve our various penal, charitable, and correctional institutions from the same individuals, who, under various "aliases," over and over again pass through their wards during their itinerancy, which often involves a life record. We appeal to this association as we do to the medical profession throughout the land, to inaugurate and stimulate all legislative action that shall better the care, and especially the control, of the pauper inebriate, and give him an equal chance at least with the other wards of the State, and thus help to solve a problem that has agitated the public and puzzled legislators and burdened communities from the earliest ages of civilization. We believe the solution of the problem will be found in following the advice and opinions of those experts whose experience we have endeavored to present in this paper.

PAPERS DISCUSSING THE GENERAL AND SPECIAL FORMS OF
TREATMENT FOUND MOST AVAILABLE IN THE PRACTICE.

QUESTIONS OF DIET IN THE TREATMENT OF INEBRIETY.

By J. H. KELLOGG, M. D., Battle Creek, Mich.

Superintendent of the Battle Creek Sanitarium.

The marvelous progress which has been made in scientific medicine within the last twenty-five years, especially through the aid of the physiologic laboratory, has wrought a great revolution in the views of medical men respecting the value of alcohol in health and disease, as well as in relation to many other medical questions. The purpose of this paper is to sum up in a brief way the present status of this question as viewed, not from the empirical, but from the scientific standpoint.

As regards the physiologic effects of alcohol, the discussion has practically been closed. Experiments upon both human beings and lower animals have been so greatly multiplied within the last few years that the effects of alcohol upon the healthy animal organism are now as well understood as are the physiologic effects of opium, strychnia, and other drugs in common use, and the experimental method has been brought to such a state of perfection that there is no opportunity left for divergence of opinion.

That alcohol is a poison to all living organisms, both animal and vegetable, is no longer disputed. It is a waste or excretory product of the yeast fungus, and is so poisonous to the yeast cell that 1 part in 1,000 in solution enormously lessens the growth of yeast. Numerous experiments, the details of which may be found in the report of the committee of fifty, have shown that alcohol, even in very small doses, is also poisonous to the higher organisms. For centuries the erroneous belief has prevailed that while alcohol was poisonous in large doses, it was nonpoisonous, even a food, in small doses; but the more refined methods of observing vital phenomena, and the development of a more perfect laboratory technique, have shown that the so-called physiologic effects produced by small doses of alcohol are merely defensive efforts on the part of the body, the result of the resistant action of the tissues toward a recognized poison. This is clearly evidenced if we note the effect of alcohol, even in small doses, upon increase of secretion, but the increased secretion is chiefly mucous, showing that the purpose of the secretion is to protect the tissues against the irritant effect of the drug. Alcohol, when introduced into the stomach, as shown by Pawlow, produces an abundant flow of mucus, and also stimulates the formation of acid, but remains without action upon peptic glands. When this action is many times repeated the final result (Wood) is obliteration of the peptic and acid-forming glands and chronic gastric catarrh, the result of the defensive hypertrophy of the mucous glands.

John Hay (Lancet, June 12, 1904) attributes the stimulant effect of alcohol wholly to its reflex action resulting from irritation of the buccal, esophageal, and gastric mucous surfaces. He asserts that alcohol in very small doses has no effect upon the heart, but that large doses enfeeble its action through producing a toxic effect upon the muscular protoplasm.

The supposed stimulant effect of alcohol has gradually evaporated under the sunlight of modern research until it has been reduced to the mere temporary irritation produced by the contact of alcohol with the nerve endings in the mucous lining of the stomach. The exhilaration following a moderate dose of alcohol is due not to stimulation, but to the narcotizing effect of the alcohol upon the vaso-motor and inhibitory centers, the abolition of the sense of fatigue through the paralyzing of the controlling centers, and the momentary flooding of the brain with blood through the paretic dilatation of its nutrient vessels.

The toxic influence of alcohol upon living tissues is well shown in the fact cited by Metchnikoff (*The New Hygiene*), who has clearly shown that alcohol lessens immunity to a marked degree. Abbott, Metchnikoff, and many other observers testify that alcohol lessens vital resistance as well as the development of immunity. This has been shown with reference to the streptococcus and numerous other pathogenic bacteria.

Tiegl has shown by eighty-six experiments upon human beings that alcohol, even when given in moderate doses, invariably produces a lowering of the body temperature, the amount of temperature depression being almost in direct proportion to the amount of alcohol administered. This fact, according to Wood (*Therapeutics, Materia Medica, and Pharmacology*), is due to the toxic effect of alcohol in checking metabolism.

Harnack and Laible, from their studies of the effects of small doses of alcohol on the animal organism, reached the conclusion that under the influence of alcohol there is not only an increase in the amount of heat radiated, but a simultaneous decrease in the amount of heat produced.

Modern arctic explorers invariably exclude alcohol from their daily ration, basing their action on the result of experience as well as those of laboratory research. This fact is one of tremendous importance, for if there are conditions of any sort which would seem to afford a favorable opportunity for alcohol as a really economic source of energy, it would seem to be those to which the arctic explorer is exposed.

The toxic effects of alcohol are shown in a very striking way by its influence in hindering the formation and accumulation of glycogen in the liver. The storage of glycogen in the liver is one of the most important means of defense against bacterial infection. Any interference with this function lessens resistance to infection. Salant's experiments upon rabbits show conclusively that alcohol hastens the disappearance of glycogen by disturbing the hepatic function, just as do other toxic agents, as shown by Roger.

Another and more recent charge against alcohol is that it encourages intestinal auto-intoxication. The observations of Combe, Tisier, Metchnikoff, Von Noorden, Escherich, and numerous other authorities, have shown us the enormous rôle played by intestinal auto-intoxication in both acute and chronic disorders. Dana pointed

out more than a dozen years ago the probability that most nerve degenerations are the result of the action of toxins absorbed from the alimentary canal. Metchnikoff has shown that arterio-sclerosis and premature senility are chiefly due to this cause. Combe, of Lausanne, Arbuthnot Lane, of London, and others, have shown that neurasthenia and many other chronic nervous disorders, various cachexias, skin maladies, and, in fact, the great majority of chronic disorders, are due to long-continued action of toxins absorbed from the alimentary canal.

Hunt has made a series of observations which show that alcohol produces both an absolute and a relative increase of putrefaction products (etheral sulphates) in the urinary secretion, and suggests that cirrhosis of the liver and alcoholic amblyopia are not due to the alcohol itself, but to the products of intestinal putrefaction, the amount of which is very greatly increased by alcohol.

Boix^a published a dozen years ago the details of extended experiments upon rabbits and other animals, which clearly demonstrate the correctness of the view recently expressed by Hunt.

The question of the food value of alcohol has been very warmly discussed, especially since the experiments of Anstie. For a long time there was very great divergence in the results obtained by various experimenters, but within the last few years there has come to be a general concurrence in the opinion that alcohol can not be considered in any proper sense a normal foodstuff. The experiments of Atwater and others show clearly enough that alcohol is oxidized or metabolized in the body, but the same is true of opium and nearly all other organic substances. Anything that will burn will produce heat. Anything which will combine with oxygen under the conditions in which oxygen is found present in the body, whether in the alimentary canal, the blood, or the tissues, will give rise to heat; but this is not normal heat metabolism. The formation of heat in the body takes place in connection with cell activity. Heat may be considered as in large part a waste product. Muscular activity, gland activity, nervous activity, cell activities of all sorts in the body, are accompanied by heat production, and this is the normal way in which heat is produced. Iron filings introduced into the stomach will undergo oxidation and thus give rise to heat. This fact does not entitle iron filings to be classified as a food. The alcohol molecule is easily broken down when brought in contact with oxygen in the chemical condition in which it exists in the blood and other tissues. But the same is equally true of butyric acid, formic acid, strychnia, fusel oil, wood naphtha, sulphuric ether, and a thousand other organic compounds. Alcohol is less toxic than many of these substances, hence produces less disturbance in the vital economy, but this fact does not entitle it to rank as food.

In a series of experiments Professor Atwater sought to prove that alcohol lessens the loss of protein and other elements of the tissues. This is one of the claims in favor of alcohol set up more than fifty years ago by William Hammond and others. He maintained that although alcohol may not be in itself a food it protects the system against all destruction of tissue and economizes the body resources. Atwater's carefully conducted experiments, however, absolutely destroy this ingenious apology for the use of alcohol. Atwater says in regard to the results of his experiments that in each case the sub-

^a Boix, Emile Theodore: "Le Foie des Dyspeptiques," Paris, 1895.

stitution of alcohol for butter or sugar in the diet "resulted in a loss (or an increased loss) of body protein, which loss continued through the three days of the alcohol period."^a

Commenting upon the results obtained, Atwater remarks that they may be "interpreted as indicating that the subject worked to better advantage on the ordinary diet than on the diet of which a part was alcohol."

In the case referred to the average elimination of nitrogen in the nonalcoholic period was 15.5 grams daily. In the alcoholic period (each period lasted three days) the loss of nitrogen was 17.1 grams daily, and in the after nonalcoholic period 15.5 grams—a difference of 1.6 grams of nitrogen, the equivalent of 10 grams of protein, representing 14,000 calories (lesser) of energy. Allowing a possible gain of 1 per cent from the food from an improvement in digestion produced by alcohol, though Atwater admits this to be very problematical, there is on the whole a great loss, for an increase of 1 per cent in the utilization of the foodstuffs would amount to not more than 2,500 to 3,000 calories—less than one-tenth the amount shown to be lost by the increased waste of nitrogen produced by alcohol.

Notwithstanding his evident purpose to maintain the food value of alcohol, Atwater makes the following frank admission:

In large quantities it is positively toxic, and may retard or even prevent metabolism in general and protein metabolism in particular. In small doses it seems at times to have an opposite influence, tending to increase the disintegration of protein. This action, though not conclusively demonstrated, is very probable. It offers a satisfactory explanation for the occasional failure of alcohol to protect protein, the assumption being that the two tendencies counteract each other. The only justification for calling alcohol a protein poison is found in this disintegrating tendency.

This last admission by Atwater is highly significant. He frankly states that in large doses alcohol is "positively toxic," and demonstrates this by reference to the fact that it retards or prevents metabolism in general and "protein metabolism in particular." Here Atwater cites as proof of its poisonous properties the very fact which has for nearly half a century been harped upon as evidence that alcohol is a valuable remedy.

In discussing this subject just thirty years ago the writer wrote as follows:

But if alcohol did really hinder the destruction of the tissues, so as to prevent the natural process of disintegration, it would still be very injurious, for all the processes of life are dependent upon destructive change of tissue, and hence anything which would hinder this process would hinder vital action—would interfere with the life processes which are essential to the manifestation of life.

During the thirty years which have elapsed since the preceding paragraph was written I have carefully watched the progress of physiologic experimentation in relation to alcohol, and have found no occasion for changing the position then taken, and am glad now to know that this position is backed up by so distinguished an investigator as Professor Atwater.

Having shown that alcohol is "positively toxic in large quantities," Atwater presents another fact which is equally important in this connection, stating that "in small doses it seems to have an opposite influence, tending to increase the disintegration of protein." So we have positive proof that small doses as well as large doses of alcohol are also "positively toxic." This Atwater recognizes in the admis-

sion that a "justification for calling alcohol a protein poison is found in this disintegrating tendency."

If, then, alcohol is a "positive poison" in large doses and a "protein poison" in small doses, in what doses can it be called a food and under what circumstances can it be recommended for habitual or daily use?

In view of the above facts, the statement is amply justified that Professor Atwater's exhaustive experiments with reference to the influence of alcohol upon digestion and nutrition show its effects to be damaging rather than beneficial—

(1) Because the effects of alcohol in increasing the palatability of the food nutrients were nil.

(2) Because the loss of energy through the increase of protein waste under the influence of alcohol was ten to fifteen times greater than the possible gain from the influence of alcohol upon protein digestion.

(3) In large doses alcohol diminishes metabolism, and hence hinders the use of the protein after it has been absorbed, while in small doses it increases protein waste, thus demonstrating itself to be in both large doses and small doses a protein poison, and hence in no sense a proper nutriment.

(4) Alcohol has no value as an aid to digestion in persons who are suffering from slow digestion, as in hypopepsia or hypohydrochloria. The experiments show simply the degree to which a healthy organism may tolerate the introduction of this substance, a confessed poison, without grave interference with normal physiologic processes.

The experiments made by Chittenden, referred to later, show most conclusively that alcohol, even in very small doses, interferes seriously with the digestive activity of the gastric juice which is already of inferior quality. The same fact has also been demonstrated by the writer in a series of experiments, the results of which will be detailed later.

The influence of alcohol upon the inhibition functions is a question which has an important relation to digestion.

Pawlow and his pupils have demonstrated the existence of a secretory-inhibitory influence controlling both the gastric glands and the pancreas. The facts developed in these remarkable experiments are of such great importance in relation to this question that we will quote the exact words of the eminent investigator in the following paragraph:

Our experiments, in which diseased conditions of the large or small stomach were experimentally provoked, have shown with great regularity that the first reaction of the peptic glands to a powerful and unusual influence consists in a marked depression of their activity, lasting for several hours, or even days. This depression is of a reflex nature. It is due to the influence of the inhibitory nervous system, which is thrown into activity by the more than ordinary degree of stimulation. When one, for instance, pours ice-cold water or a solution of nitrate of silver into the large stomach (experiments of Dr. J. C. Soborow) the secretion which is subsequently produced by an ordinary meal is less than normal, more especially in the first hours. This happens not only in the large cavity, but also in the small, the walls of which latter at no time come into direct contact with the injurious substance. The thought suggests itself that as soon as the stomach encounters an unaccustomed stimulus the activity of the peptic glands is at once inhibited by means of a special reflex, whose object is to protect the deeply lying cells still further against harmful influence. The only exception to this is observed after the action of strong alcohol. When alcohol is poured into the large stomach an extremely free secretion of gastric juice begins from the small cavity. Conversely, by acting on the latter, the alcohol is also able to set up an abundant secretion in the large.

Here we have the actual proof not only that alcohol may destroy through its narcotic influence the inhibitory control of the nervous system, as ordinarily exercised upon the gastric glands, but that it actually does this. After having established the fact that strong stimuli of every sort, thermal as well as chemical, have the uniform effect to lessen gastric secretion when brought into contact with the mucous membrane of the stomach, he calls especial attention to the fact that alcohol is the one and only exception to this rule. When introduced into the stomach it produces the very opposite effect, evidently through the destruction of inhibition. In this regard alcohol behaves in the stomach as elsewhere in the body. No matter what the structure or organ with which alcohol is brought in contact, its influence is universally found to be inhibitory.

For example, Nadler found that men on the verge of delirium tremens had a much shorter reaction time than healthy persons. Krapelin and others have also shown that under alcohol various elementary mental processes are hastened. This fact, however, as observed by Abel and numerous other physiologists, does not prove that alcohol is a stimulant of the functions of the brain while a depressant of all other function, but is an indication of the paralyzing influence of alcohol upon the inhibitory functions upon which the regulation of the bodily activities ordinarily depend. It is just as important that the secretory activity of the stomach should be controlled by inhibitory centers as that it should be stimulated by excitory centers. If the excitory nerves were alone operative, then the stomach would become cataleptic, as James suggests in relation to the cerebrum; that is, the secretion of gastric juice, having once begun, would continue indefinitely. This is, in fact, the condition which does exist in certain cases of disease (gastro-succorrea), in which, in the absence of all stimuli, the gastric secretion continues day and night without cessation, evidently because of the suspension of the normal control exercised by the secreto-inhibitory mechanism.

Pawlow's experiments show beyond chance for reasonable doubt that the effect of alcohol when applied to the stomach is to set aside a portion of this mechanism. The smaller the dose, of course, the less the effect. In a very small dose the organism might possibly be able to struggle against the toxic influence of the drug and so maintain a fair degree of control of the secretory process, and in a larger dose, the influence of the inhibitory nerves being wholly overcome, the result is, as Pawlow says, "an extremely free secretion of gastric juice."

The fact that this secretion is observed in the small cavity of the Pawlow pouch, as well as in the large stomach, is an indication that the effect produced operates through the nervous system, and that it is not due simply to the local influence of alcohol upon the secreting cells with which it comes in contact.

That it has a depressing rather than a stimulating influence is also shown by the fact that the universal effect of unusual stimuli upon the stomach is to produce suspension of secretion, rather than "an extremely free secretion." Although Pawlow makes no comment in relation to the mechanism of the effect observed from the use of alcohol, the conclusion we have drawn seems to be the only one possible in relation to the influence of alcohol upon gastric secretion. This explanation also accords with the facts of clinical experience. The withdrawal of the normal controlling influence exerted by the

inhibitory nerves upon the gastric glands permits these secreting structures to exhaust themselves by excessive or continuous activity. While the first effect is to produce such an overaction as seems to greatly add to the individual's digestive capacity, the final result is premature exhaustion, and in the end atrophy and degeneration of the secreting structures of the stomach. This is the condition commonly associated with gastric catarrh, so commonly found in free users of alcoholic liquors, viz, a hypersecretion and hyperchlorhydria, later hypochlorhydria, and later still apepsia or achylia.

As additional evidence the writer desires to put on record a clinical fact drawn from his own observations and those of his immediate colleagues. The records of the clinical laboratory of which I have charge show the results of the quantitative analysis of gastric fluid obtained after an Ewald test meal in more than 30,000 cases.

An examination of the histories of these 30,000 cases shows that 1,500 of them, or 5 per cent, were habitual users of alcohol. Hyperhydrochloria existed in 42 per cent, hypohydrochloria (HCl less than 0.180 per 100 c. c.) in 50 per cent, and normal acidity (acidity 0.180 to 0.200 per 100 c. c.) in 8 per cent.

Of the 1,500 who had been habitual users of alcohol, 65 were cases of inebriety and applied for treatment for this condition.

A study of the findings in 1,000 cases, selected without reference to the use of alcohol, taken just as they come in our record books, gives:

	Per cent.
Hyperhydrochloria.....	41.8
Hypohydrochloria.....	50.2
Normal.....	8.0

These figures are practically identical with those obtained from the habitual users of alcohol. If the habitual use of alcohol actually increases useful gastric secretion, we should certainly expect to find in a large number of users of the drug an average acid secretion considerably higher than that of nonusers. This is not the case. The figures obtained are practically the same for the two classes.

The general effect of alcohol upon gastric secretion when studied statistically is more clearly shown in the 65 cases of chronic alcoholism. It would be naturally expected in these cases that the effects of alcohol would appear more prominently. A study of the chemical findings shows:

	Per cent.
Cases of hyperhydrochloria.....	23
Cases of hypohydrochloria.....	71
Normal.....	6

In comparing these figures with those found in most users of alcohol, we find the cases of hypohydrochloria increased more than 40 per cent, and cases of hyperhydrochloria decreased nearly 50 per cent. This is exactly what we should expect, for this result agrees exactly with the results which follow the long-continued administration of alcohol to animals. Friedenwald, in his experiments upon rabbits, to whom he administered alcohol in moderate amounts during long periods, observed "a gradual reduction in the amount of free HCl in the gastric secretion." He also observed hyperemia, increased secretion of mucus, and fatty degeneration of the epithelium of the gastric tubules (Welch).

The above figures present overwhelming evidence that alcohol has no practical value in exciting gastric secretion, and that the ultimate effect of the use of alcohol is to lessen gastric secretion, and hence to impair digestive activity.

Schmiedeberg, Bunge, and other investigators have shown most conclusively that alcohol is a depressant agent, lessening all those physiologic activities which are involved in oxidation and circulation, respiration, and body temperature. It is altogether inconsistent, then, to suppose that an agent which is a depressant everywhere else in the body becomes in the alimentary canal an excitant of normal activity. If we accept the views of Edkins, Starling, and Bayliss, that gastric secretion is carried on not under the direct influence of excitatory nerves, but rather as the result of the stimulating influence of gastrin or gastric secretion produced by the mucous membrane of the pyloric end of the stomach, and set free by means of dextrin, maltose and peptogen, and various other so-called peptogens, the influence of the secreto-inhibitory nerves in the control of the secretion becomes in the highest degree important, since it is only through inhibition that they exert whatever control can be exercised by the central nervous system over the secretory function of the stomach.

The facts above stated and the conclusions drawn remain valid no matter which view of the mechanism of the secretion is adopted, or whether both these are correct, as has been suggested by Frouin (*Lancet*, August 19, 1905, p. 502).

Singer, who experimented upon rabbits, claimed that if true this is another illustration of the effects of alcohol in paralyzing inhibitory nerves. In no other way could this increase of activity be accounted for, since it is well enough known that the direct influence of alcohol is to lessen muscular power or activity, as shown by the fact that so small an amount as half of 1 per cent applied directly to the heart of a frog produced decided diminution in its energy. It is true that the same apparent effect might be produced by stimulation, and if alcohol were known to be a stimulant this conclusion would be legitimate; but when the depressant and nonstimulating properties of alcohol have been so thoroughly established by a multitude of competent investigators in all parts of the world consistency requires that the phenomena following its use should be explained in harmony with this well-established fact, rather than in opposition to it. To assume that alcohol is capable of stimulating peristalsis by exciting muscular activity is to deliberately contradict all the positive facts which are known in relation to its influence upon living tissues and vital functions.

If it be argued that a depressant effect would act equally upon both the inhibitory and the excitatory nerves, so that no change in activity would occur, it is only necessary in reply to recall the fact that the inhibitory influences are necessarily weaker than excitatory influences. The excitatory impulses are primary and essential to life, while the inhibitory influences exist merely as a modifying and controlling factor. Hence the presence of a paralyzing agent naturally makes itself felt more distinctly by its effects upon the inhibitory rather than the excitatory mechanism, unless applied with such vigor as to overwhelm and annihilate all nervous influence.

Abel says, with reference to muscular action in general, that "both science and the experience of life have exploded the pernicious theory that alcohol gives any persistent increase of muscular power." This

principle must hold good in relation to the internal and involuntary muscular structures, as well as to the voluntary muscles. The experiments made by Hare and numerous other investigators upon the heart show this to be undoubtedly true.

The experiments of Chittenden (Report of the Committee of Fifty) showed that while alcohol excites gastric secretion it diminishes peptic activity. He also noted that this effect was especially marked in cases in which hydrochloric acid was already feeble in character. This observation led me to make an experimental study of the effect of alcohol upon the gastric fluid obtained from the stomach after a test meal. The findings are decidedly interesting.

In our laboratory we employ for testing the peptic activity of gastric fluids the method known as Mett's, which consists in dropping into a portion of the fluid a small glass tube containing coagulated egg albumen. The fluid is placed in an incubator for twelve hours at 100°. At the end of this time the length of the column of albumen which has been digested is measured. Normal gastric fluid should digest four milligrams of coagulated albumen in twelve hours. In employing this method it is very easy to determine the effect of alcohol upon the digestive activity of any given fluid and note the effect of different proportions of alcohol. For some weeks I submitted the surplus gastric fluid left after the ordinary tests to tests for determining the influence of alcohol, using alcohol in the proportion of 1 per cent, 5 per cent, and 10 per cent. The result was almost uniformly a lessening of the digestive activity in the gastric fluid. In the two cases in which the digestive activity seemed to be increased there must have been an error in observation. The effect of a 1 per cent solution of alcohol was not shown to be deleterious in every case, but the 5 per cent solution produced a very marked diminution in digestive activity, and there were only a few instances in which the 10 per cent solution did not completely annihilate the digestive power of the gastric juice, even in cases in which it was unusually active. An interesting fact observed was that in cases in which the gastric juice was lacking in hydrochloric acid, showing no peptic activity whatever, but becoming active when hydrochloric acid was added, the addition of a 1 per cent solution of alcohol completely annihilated digestive activity, when remarkably high figures were obtained before adding the alcohol. For example, in one case in which without acid the peptic activity was zero, but after the addition of acid 10 milligrams of albumen were digested in twelve hours, the addition of 1 per cent of alcohol completely stopped the digestive action.

In view of the facts which are now known in relation to the influence of alcohol upon digestion, there seems to be left no ground upon which to defend the use of this drug as a gastric stimulant. Indeed, the effects of alcohol upon the stomach coincide precisely with the effects observed upon other functions.

Alcohol when taken habitually gradually loses its effect upon the inhibitory nerves of the stomach, and so the apparently systemic effects first produced gradually disappear.

Harm showed (1895) that repeated doses of alcohol, if gradually increased, cause at first an increase in the acidity of gastric secretion in a dog, but this increase was within a few days followed by a decrease, not only in the acidity but also in the amount of secretion.

The fact remains the same whatever the explanation may be. Even if it be admitted that alcohol directly stimulates the stomach, which, in view of its known depressant action upon all other nerves and structures, it is difficult if not impossible to concede, whatever stimulating effect it may at first have is to be maintained only by increasing the dose, and is finally lost altogether, a result which universally follows the continual employment of any true poison. This fact alone proves alcohol to be not a food but a poison in any and all doses.

A few months ago I had the pleasure of spending a short time with Pawlow in his laboratory in St. Petersburg. Among other interesting things I saw there was what has been facetiously called a "canine dairy." Pawlow had eight or ten dogs provided with gastric and esophageal fistulæ. When the dog eats in the ordinary way the food drops out through the opening in the esophagus, while at the same time a small stream of gastric juice flows out through the opening in the stomach. Every morning at 4 o'clock these dogs are brought up from their kennels and placed in their harnesses upon a long table and are fed for four hours, at the end of which time each dog has produced about a liter of gastric juice. The juice is carefully filtered and deodorized by passing through charcoal and is shipped to various European specialists who make considerable use of it in the treatment of specially obstinate cases of gastric disease. Doctor Henecke, who has charge of this department of the laboratory, told me that the sale of "dog juice" is an important source of income from the laboratory, the appropriations for which, made by the Russian Government, are quite inadequate to meet its requirements. Occasionally a dog becomes indisposed and fails to produce the usual amount of juice. I suggested to Doctor Henecke whether under such circumstances he would think it proper to resort to the use of alcohol. He threw up his hands in great surprise that I would offer such a suggestion, and assured me that alcohol was never given to the dogs, and for the reason that the activity created by it was not normal and in the end results in diminished secretion. This fact has been abundantly confirmed by numerous observers. Last year I repeated an experiment upon a dog provided with a Pawlow's pouch in my own laboratory, and found at the end of a few weeks a very notable diminution in the secretion of hydrochloric acid; in fact, free HCl disappeared entirely. The dog was a medium-sized animal and the amount of alcohol administered was 14 grams daily in the form of brandy diluted with water.

Pawlow's dogs are cared for with a degree of solicitude far exceeding that ordinarily given to human infants. The sanitary condition of the rooms in which they live, the ventilation, the temperature—all of these matters receive the most careful attention. In relation to food and feeding, these animals have the benefit of the most profound and up-to-date information which the world possesses. Pawlow unquestionably stands at the head of all physiologists who have ever lived in researches pertaining to digestion.

The majority of human beings are less fortunate than Pawlow's dogs as regards the care of their digestive functions. Certainly it is our duty as medical men to make available for our patients as rapidly as we are able to do so the results of laboratory research which concern human nutrition, especially as relates to the influence of alcohol upon digestion; for the habitual and medicinal use of this drug have contributed in no small degree to the prevailing dyspepsia of modern

times. When one considers the enormous volume of alcoholic nostrums which are annually poured into human stomachs, in addition to the floods of beer and other alcoholic beverages, it becomes a matter of wonderment that the condition of the American stomach is not even worse than it is.

The facts which I have above presented I think justify me in saying:

(1) That the habitual effect of alcohol upon the healthy stomach is to lessen the ability of the stomach to form healthy gastric juice; and

(2) That the use of alcohol even in quantities smaller than that in which it is found in beer and light wines, decidedly lessens the activity of normal gastric juice.

In this connection it must be remembered also that Chittenden as well as other investigators have clearly shown that other principles in beer and wine have a very decided detrimental influence upon gastric digestion.

Hemmeter and others, who have experimented for the purpose of determining the effects of alcohol upon gastric and intestinal motility, have shown that motility is either not affected at all or is actually decreased under the influence of alcohol. If, then, alcohol is of no value as a food or as a gastric stimulant, what useful place can be found for it in therapeutics? Schumacher, in his *Materia Medica and Therapeutics*, sixth edition, 1906, especially recommends alcohol for the following maladies: Phthisis pulmonalis, also bone and gland tuberculosis, typhoid and other fevers, hypostatic congestion of the lungs, pneumonia in aged persons, diphtheria, phlegmonous erysipelas, the insomnia and indigestion of old age, the malnutrition of sedentary persons, cholera and cholera infantum, snake bite, and gastro-intestinal auto-intoxication.

Let us examine briefly the facts in relation to the influence of alcohol in these several maladies.

ALCOHOL IN TUBERCULAR INFECTION.

Bell, of New York, demonstrated more than fifty years ago that alcohol not only does not cure tuberculosis, but that it actually favors its development. Trusseau recognized the validity of Bell's observation, and condemned the use of alcohol in tuberculosis. Wright's recent experiments have made clear the *modus operandi* of the pernicious influence of alcohol in this disease, and why persons who are habitual users of alcohol are especially susceptible to tubercular infection. The observations of Wright have shown that the tuberculo-opsonic index is definitely and uniformly lowered by alcohol. My colleague, Dr. Charles E. Stewart, in a recent series of experiments upon this subject, showed, in collaboration with Drs. A. W. Nelson and L. Stoner, of the clinical laboratory of the Battle Creek Sanitarium, that the depression of the opsonic index produced by an ounce of alcohol lasts for several hours. In one case the index was reduced from 0.93 to 0.21, at which point it was found four hours after taking 2 ounces of Peruna. In another case 2 ounces of Peruna in four hours reduced the opsonic index from 1.30 to 0.07.

In the face of these facts nothing could be more absurd than the administration of alcohol to a patient already suffering from tubercular infection. The only chance for the recovery of such a patient

is in the destruction of the invading bacteria by his leucocytes. The phagocytosis depends upon the development of the tuberculo-opsonin in sufficient quantity to enable the leucocytes to attack with vigor the tubercle bacilli. A drug which is capable of lowering the tuberculo-opsonic index from 1.30 to 0.07 must certainly exercise a most pernicious influence, and in the most pronounced degree encourage the development of the disease.

ALCOHOL IN TYPHOID FEVER.

When Doctor Brown, in the early part of the last century, substituted alcohol for bleeding in typhoid and other fevers, there was an evident improvement in the mortality rate, and this fact led to the almost universal adoption of the so-called stimulating plan of treatment. Milk and brandy every two or three hours was the regulation prescription in most of the leading hospitals in Europe and America. Thirty years ago the bill for spirits was one of the largest items in the expense account of the London hospital boards. About this time a hospital was opened in London which undertook the treatment of typhoid fever and other maladies without alcohol, and with such remarkable success that skepticism respecting the value of alcohol as a supporting agent in fever rapidly developed, and at the present time the stimulant plan has been almost altogether abandoned in all well regulated hospitals, and for it has been substituted the cold bath of Brand, the cooling pack of Winternitz, and other rational means.

Chapman more than sixty years ago took a decided stand against the then prevailing practice of using alcohol freely in fevers, declaring that he employed alcohol with as much reserve as bleeding, and that he obtained the best results in cases in which it is not employed. A fever is a vital battle against invading parasitic organisms. Alcohol lessens vital resistance, hinders the process of immunization, weakens the heart, narcotizes the nerve centers, and does not meet a single indication which can not better be met by other safe and rational means.

ALCOHOL IN HYPOSTATIC PULMONARY CONGESTION.

One of the most marked characteristics of alcohol is the vasomotor paresis which it induces. How, then, can it possibly do any good in hypostatic congestion? A fomentation to the back, with the patient turned upon the side, the elevation of the head and shoulders of the patient, derivative applications to the feet and legs, or, if necessary, to the whole lower half of the body, are measures which produce immediate alleviation, and without any risks or possibility of harm. Alcohol can do nothing more than produce a temporary sensation of relief while actually aggravating the condition.

ALCOHOL IN PNEUMONIA.

The apparent benefit of alcohol in pneumonia, according to Doctor Shoemaker, must be based upon the supposition that alcohol somehow increases the energy of the heart; but that this is not true has been so often proved by actual experiments, especially by the experiments of Crile and Hare, that there can be no longer any doubt as to

the truth upon this point. Alcohol weakens the heart, lessens the resistance, lowers the pneumo-opsonic index, hinders immunization, and delays resolution. Derivative applications to the legs, the chest pack, and especially an abundant supply of cool, fresh air and absolute withholding of alcohol, give the aged sufferer from pneumonia a fair change for recovery.

ALCOHOL IN DIPHThERIA.

The idea that alcohol is somehow a supporting agent has led to its use in diphtheria as well as other infections, but experiments of Metchnikoff, Roger, and numerous other competent investigators, have shown that alcohol actually increases the susceptibility of the organism to bacterial infection, and hence not only prepares the way for infection by diphtheria and allied maladies, but encourages and intensifies the infectious process when once begun. There is no scientific evidence that alcohol ever saved the life of a single child suffering from diphtheria. The use of antitoxic serum has undoubtedly saved the lives of thousands by aiding the natural resistant forces of the body. Alcohol paralyzes these forces, and hence can do nothing but antagonize the normal process of cure.

ALCOHOL IN ERYSIPELAS.

The remarks made with reference to diphtheria apply equally well to erysipelas and other bacterial infections of the body. Since alcohol lowers the opsonic index and hinders immunization, what else can it do but hinder the curative process?

ALCOHOL IN INSOMNIA.

Alcohol is a narcotic, and in very moderate doses perhaps produces less vital disturbance than most other hypnotics; but its effects are extremely uncertain. In most cases the dose must be rapidly increased, and its influence in increasing intestinal auto-intoxication must hasten the processes upon which premature senility or arteriosclerosis depend, as has been shown by Metchnikoff. The malnutrition of sedentary persons, for which Shoemaker recommends alcohol, should be relieved by removing the cause of the malnutrition rather than by the deceptive influence of alcohol. More fresh air, care in the selection and mastication of food, the proper adjustment of the several food principles, especially the avoidance of a high protein ration, and attention to proper intestinal activity, are measures which definitely and permanently improve the nutrition of the sedentary man, while alcohol produces only a temporary appearance of improvement, and often induces a drug habit with most pernicious consequences.

ALCOHOL IN CHOLERA AND CHOLERA INFANTUM.

Here again we find alcohol recommended under conditions in which the body is already overwhelmed by bacterial toxins. If recovery occurs, it will only be because the organism is able to destroy and eliminate these toxins before they have accumulated to such an extent as to produce vital disorganization. What good could be

expected from the addition of another bacterial poison to those with which the body is already struggling? Alcohol can do no possible good in these infectious disorders in which its influence, as in all infections, has been shown to be not only to diminish vital resistance but to hinder recovery.

ALCOHOL IN SNAKE BITE.

While recommending alcohol for snake bite, Shoemaker admits that there is little or no scientific evidence of its efficacy. The reputation of alcohol as a remedy for snake bites doubtless rests on the fact that only a comparatively small proportion of those who are bitten by snakes are actually poisoned. The virus is absorbed by the clothing when the bite occurs upon a covered portion of the body, or the virus may be ejected before the fangs are inserted into the tissues. It is quite possible, as intimated by Shoemaker, that deadly harm has been done by the great doses of alcohol administered in these cases.

ALCOHOL IN GASTRO-INTESTINAL INFECTION.

Alcohol has been recommended and used in many cases of intestinal auto-intoxication which resembled in their clinical course malarial fever and other specific febrile affections. The impropriety of using alcohol in such cases has been clearly demonstrated by Hunt, whose experiments showed that the ethereal sulphates, or products of putrefaction, are greatly increased in the urine under the influence of alcohol. In intestinal auto-intoxication the liver and other poison-destroying glands are already overtaxed in their efforts to cope with the enormous quantities of toxins with which they are called to deal. The addition of alcohol under such conditions can do nothing but harm.

I need not longer tax your patience with the consideration of specific maladies for which alcohol is often administered. The list of maladies in which alcohol has been administered is a long one. It includes in fact, almost every malady to which human beings are subject.

If we should study the whole category we would not find a single malady for which alcohol is a specific remedy; and I venture to say that we should not find a single one in which alcohol renders service which can not be better rendered by some other and more rational means.

My personal experience has fully persuaded me of the absolute truth of this statement. I was trained in the practice of medicine under the elder Flint. He was a warm advocate of the use of alcohol in pneumonia, typhoid, and other fevers, and especially recommended its use in phthisis. In beginning practice more than thirty years ago, I was inclined to make occasional use of the drug under the supposition that it possessed stimulant properties, but as laboratory research gradually made clear the fact that alcohol possesses no stimulant properties whatever except through the transient irritation which it produces when brought in contact with living tissues, and that its real effect is depressant and paralyzing, I lost faith in its curative virtues, and for more than twenty-five years have excluded it from my practice; and I can not recall a single instance in which I have had reason to believe that its use would have rendered any

service whatever. I have never taken the position that I would not make use of alcohol under any conditions, but have held myself in readiness to use it in any cases in which I could find a rational basis for its application. I am ready to say frankly that in the light of my experience and the accumulated evidence of the nature and effects of this drug I do not expect to encounter such a case.

Alcohol should be relegated to the limbo of discarded drugs which have been tested and found wanting. The social and moral mischief which the drug has done, as well as its physical effects, give sufficient reason why it should be accorded drastic treatment, and avoided if possible. A decided stand against alcohol on the part of medical men, a clear statement of its uselessness as a food and as a medicine, and of its pernicious effects upon the animal organism, would arrest the attention of the public and advance the cause of temperance as no other means could do.

A PLEA FOR THE ESTABLISHMENT OF HOSPITALS FOR THE RATIONAL TREATMENT OF INEBRIATES.

By CHARLES A. ROSENWASSER, M. D., *Newark, N. J.*,

Attending physician to the Presbyterian Dispensary, member of adjunct staff of St. James Hospital, vice-president of the dependency and crime commission of the State of New Jersey.

In its report to the Hon. John Franklin Fort, governor of New Jersey, the dependency and crime commission, appointed by him for the purpose of making inquiry as to the causes of dependency and criminality and for the suggestion of remedial measures, says:

We desire to call attention to the importance of the establishment of a hospital for persons who are afflicted with the habitual addiction to alcohol and other narcotic drugs, so that they may be scientifically treated and restored to usefulness. It is the consensus of opinion that our present method of dealing with the inebriate who falls into the hands of the law, as he is very apt to do, is barbarous and inhuman, and is a relic of the Dark Ages. Punishment for drunkenness has been meted out for centuries, and has been proven to be an absolute failure. Why should this method be allowed to continue when there is a more rational method of dealing with these unfortunates, many of whom, through heredity and environment, are more sinned against than sinning—a method which in the light of modern progress is as bright and full of hope as the present method is full of darkness and despair? The State needs most urgently a hospital for inebriates, as a means of preventing insanity, diseased and degenerate offspring, and dependency and crime. Aside from its incalculable value as a saver of men and women, it would be a great financial gain in the end.

That this statement is concurred in by practically every person who has given any thought to the question you all know. You also know, however, that there are a large number of persons who are in absolute ignorance of the possibility, practicability, and feasibility of restoring the inebriate to a life of usefulness, and that inebriety is one of the most curable of chronic diseases, provided that treatment is begun in time, is properly conducted, and is persisted in for a sufficient length of time. It is plain, therefore, that in order to bring about the rational treatment of the inebriate we must with renewed vigor and energy continue the campaign of education begun years ago by Turner, Rush, Mott, Crothers, Day, Parrish, Mason, and others.

Generally, the public is skeptical as to the possibility of curing the alcohol or drug inebriate, and hence we are asked, Can this disease be cured? Is it possible to restore the drunkard and drug user to a life of sobriety and usefulness?

Let us investigate these questions. Let us consider the views of some of the world's most prominent students of the subject and acquaint ourselves with some interesting facts.

Dr. T. D. Crothers, of Hartford, Conn., editor of the *Journal of Inebriety*, author of many books and monographs upon the subject,

a man who has devoted his entire life to the study and treatment of inebriates, says:

The best authorities unite in considering 35 per cent of all patients remaining under treatment one year or more as permanently cured. * * * In view of the chronic character of these cases these statistics are encouraging and indicate great possibilities for the future from a better knowledge and treatment of these cases.

Doctor Day, for many years head of the Washingtonian Home, Boston, an institution now in the fifty-second year of its existence, made a study of 8,000 cases that had been under treatment and found over 30 per cent sober and temperate. He says:

Twenty-two years of experience in this work has taught me that the task is neither hopeless nor thankless; nor would it be if the measure of success had been lessened one-half from the known rate of percentage of cures.

Doctor Mason, formerly of the Kings County Home, New York, examined the records of 2,000 cases that had been away from the asylum for ten years, and found 36 per cent of all cases cured.

When we consider that in the above-mentioned institutions there are encountered the worst cases the percentage of cures is encouragingly high.

That inebriety can be successfully treated and that a hospital for inebriates is a great saving and not an expense to the Commonwealth has been demonstrated to the satisfaction of the people of Massachusetts where, at Foxboro, there has been such an institution in successful operation for about eighteen years. From Mr. Robert A. Woods, president of the board of trustees, I learn that the average number of commitments last year was 127, and a total number of 480 men were cared for, most of whom were skilled workmen. The methods of this hospital include medical treatment in the first stage with stimulating industry, gymnasium and baths, proper diet, intellectual and moral stimulus, and visitation by volunteer visitors after discharge. An investigation is made each year as a result of which it is known that 30 to 40 per cent of the patients remain temperate for at least a long period, and from 15 to 20 per cent more show definite improvement.

Progressive Switzerland has long since learned that inebriety is a curable disease and that it pays to maintain a hospital for the purpose. At Ellikon, near Zurich, there has existed such a hospital for the past nineteen years. The result of its labors is most encouraging and proves conclusively that the treatment of inebriety has long since passed the experimental stage. From its eighteenth annual report we learn that—

Of 531 patients discharged between 1889 and 1901 there were cured 240, or 45.2 per cent; improved, 126, or 23.7 per cent; relapsed or unheard of, 165, or 31 per cent.

Of 255 patients discharged between 1901 and 1906 there were cured 144, or 56.4 per cent; improved, 61, or 23.9 per cent; relapsed or unheard of, 50, or 19.6 per cent.

At Knoxville, Iowa, there has been in existence for the past three years a state hospital for inebriates, and the results thus far are very satisfactory. From the second biennial report of this institution we learn that of the entire number of patients treated (774), 41½ per cent are known to be cured and living up to the conditions of their parole.

Minnesota has also taken the proper step in this matter, and last year established a farm for inebriates. Surely the knowledge of the excellent results obtained in the above-mentioned institutions,

as well as the results obtained in the great number of private and public institutions for the care and treatment of inebriates in this country and abroad, ought to convince the most skeptical, and should serve as a great stimulus in our efforts to overcome the obstacles which we encounter in the path of rational treatment of the inebriate, and there are many obstacles to be overcome.

Permit me to mention a few of those which I have encountered in my efforts to have a hospital for inebriates established by the State of New Jersey.

History repeats itself; and as there were editors of newspapers in days gone by who opposed the establishing of hospitals for the insane in Massachusetts on the ground that such institutions would foster the disease, and would attract patients from other States and even from foreign countries, there is to-day an editor of a Newark newspaper who opposes the establishment of a hospital for inebriates on practically the same grounds. I wonder whether he believes that the church fosters sin.

My prohibitionist friends say that I am starting at the wrong end. They say, "Prohibit the sale of alcoholic beverages and there will be no more drunkards." How easy to say, and how hard to do. What practical man believes that prohibition lessens the consumption of alcohol? What practical man doubts that the present so-called temperance wave sweeping over this country is aught but a manifestation of hysteria, and that it will soon begin to recede, leaving in its wake many a "wet" home which previously was "dry." Practical observers know that alcoholic beverages are now to be found in homes to which such beverages were strangers before, and there is good reason for believing that the percentage of children drinkers is growing. Our hope of true temperance lies in education, not in legislation. We know that inebriates have existed since the dawn of day. Who doubts that they will continue to exist until the crack of doom?

Some, who think themselves Christians, say: Inebriety is the result of the sin, and the sinner must and should suffer. Well, if this be true, let us close our hospitals and deny relief to every sufferer from whatever ill, for it may safely be said that almost all disease results from some violation of the laws of nature, and to violate the law of nature is a sin. This group of objectors is small but ever present. Its members are usually persons who are possessed of a high degree of selfishness. They can sometimes be brought to realize the importance of the rational treatment of the inebriate on being informed that an habitual inebriate is as great, if not a greater menace to society than is an insane person, and every bit as much in need of restraint for the protection of the community.

The Binghamton Asylum failure.—The failure of this, the first inebriate asylum to be established in the world, so far as is known, is a bugaboo which has been held up before me on several occasions. I am glad to have been able to look up the records of the Binghamton Asylum, and feel sure that if ever failure was due to success, then the failure of this asylum is so to be charged. It appears that this institution was a private concern owned by a stock company. It certainly made money. There was a stockholders' scramble for the funds and for control, and financial failure resulted. But so far as the curing of inebriates was concerned, this institution was a decided

success, the results of treatment being most encouraging and satisfactory. I can not imagine any greater loss to this country than was the failure of the Binghamton Asylum. Had it continued to exist, it would have served as an example to other States and countries, and similar institutions would have been established everywhere, and many thousands would have been saved from insanity, criminality, degeneracy, poverty, suffering, and early death.

"Ostrich-like" objectors are also encountered. They prefer to hide their heads in the hour of trouble. They fear that the inebriate problem is too great to cope with. Needless to say no modern student of sociology flees from a problem on account of its vastness. He tackles it because he knows that no problem can ever be solved in any other way.

The question of constitutionality has also been raised, and it has been asked whether we can deprive a man of his liberty who is not insane, and who has not been convicted of crime. Happily this question has been decided by the supreme court of Minnesota, which, in deciding the case of *Leavitt v. City of Morris*, says:

The State, in the exercise of its police power, has the undoubted right to punish drunkenness, and to provide for the detention and treatment in hospitals controlled by it of those who are habitual drunkards and have so far lost the power of self-control that they are either incapable of properly caring for themselves or are a menace to the public weal. The State has the power to reclaim submerged lands which are a menace to the public health and make them fruitful. Has it not, also, the power to reclaim submerged men, overthrown by strong drink, and help them to regain self-control?

* * * The State has for many years punished drunkenness by a fine or imprisonment. The trend, however, of legislation is to treat habitual drunkenness as a disease of mind and body, analogous to insanity, and to put in motion the power of the State, as the guardian of all its citizens, to save the inebriate, his family, and society from the dire consequences of his pernicious habit. * * *

The hospital farm for inebriates is not a penal institution, but a paternal one, seeking not the punishment of the inebriate but the safe-guarding of his interests and the safety of the public, by treating the inebriate as, what he is in fact, a man of unsound mind, and placing him under the guardianship of the State to the end that he may be healed of his infirmity.

Some say that a hospital for inebriates would merely be a place to which a man could go in order to sober up after a drunk. They are not aware that in institutions such as we are advocating patients can not leave at will, but are committed by law to be detained until they are cured or discharged or removed by law. Even though such a hospital would occasionally be imposed upon and in some way be used as a sobering place, it would be hailed as a blessing by many wives and mothers who would be grateful for any relief, however small.

The question of expense is naturally an important one. It constitutes a real obstacle, as it is apt to frighten the legislators and the taxpayers. There is little cause for alarm, however, when we consider that many patients will gladly pay for their care, that the law requires pay from all who can pay, and that the indigents are now being taken care of at the expense of the city, county, or State, in the general hospitals, jails, penitentiaries, workhouses, almshouses or insane asylums; and when we further consider that many of those who can be restored to usefulness are fast approaching the day when not only they, but their families will have to be provided for by the taxpayers, the question of expense assumes a different hue. It is therefore clear that the State is not being called upon to bear any new burden, but simply to take up a burden which it is now carrying, in a

more humane, hopeful, and enlightened manner. Who can estimate the ultimate gain to the State when we learn from conscientious students of the subject that at least 33 per cent of insanity, 60 per cent of epilepsy and idiocy, and 75 per cent of arrests are due directly or indirectly to inebriety. Aside from the financial considerations, it is as much the duty of the State to control and scientifically treat the inebriate, as it is to restrain the criminal or madman, for in the prevention of crime and dependency lies our firmest security.

It should not be forgotten that hospitals for inebriates are also intended to take care of victims of drug habits, every one of whom is on the road to the insane asylum, and very many of whom can be absolutely cured if treatment is not delayed too long. For the drug fiend there is practically no hope unless he is scientifically treated under legal restraint in a properly equipped hospital.

In addition to its value as a saver of men and women a hospital for inebriates could also serve as a reformatory for women, for it is a well-known fact that almost all fallen women are either alcoholics or drug users. It could remove the inebriate tramp from the streets and perhaps make him earn his bread by the sweat of his brow. It could serve as a center of learning for the medical profession with a field fertile with opportunity.

The people are awakening to the importance of the rational treatment of the inebriate, but the awakening is rather slow. They are busy fighting tuberculosis, and are making a gallant fight. So busily are they engaged in fighting the seed which produces the disease that they are forgetting that no seed can grow unless it lodges in appropriate soil. Alcoholism prepares the soil and renders it fertile, and hence the fight against tuberculosis, in order to be successful, must at the same time be waged against alcoholism. I can not here enter into a discussion of all the measures which have been and are advocated as preventives of tuberculosis and of alcoholism, but can say that all students of the subject agree that one of the most effective modes of warfare is by establishing in every State a hospital for the care and treatment of inebriates. There is good reason for believing that ere long there will be such a hospital in every State. Pennsylvania has already passed a bill to this effect, and the subject is receiving great attention in New York, New Jersey, and elsewhere.

The movement has the support of the New York State Medical Society, the Medical Society of New Jersey, the British Medical Association, numerous prominent judges, lawyers, ministers, and, in fact, of all persons engaged in humanitarian work, and by everything that is good and uplifting. At present the senate of New York has under consideration a bill, introduced by Senator Grattan, which provides for the establishment of labor colonies for the detention, reformation, and instruction of persons convicted of vagrancy and of habitual drunkenness. Under the provisions of this bill only those inebriates are accepted who have been arrested for drunkenness and sentenced to detention at the colony. There is no provision for the acceptance of patients before they have been convicted of drunkenness, not even if they desire to voluntarily commit themselves. This is a serious error, and one which ought to be speedily corrected. As the bill permits the trustees to establish several colonies, it is to be hoped that they will see the wisdom of providing a place for those inebriates

who are in the early stages of the disease, and for whom there is hope, before they provide for those who are in the last stages, and in whom the possibility of cure is remote even under the best of care. And it is further to be hoped that some provision will be made for voluntary commitments, and also to enable a family to place their inebriate relative under control without being compelled to have him arrested and convicted of drunkenness. The same procedure might be followed in such cases as is now being followed in committing the insane. Similar provision should also be made for drug inebriates.

After studying the laws governing hospitals for inebriates in this and foreign countries, as well as the laws governing the commitment of insane in New Jersey, I drafted a bill for the establishment of a state hospital for inebriates and had it introduced during the present session of the legislature by the Hon. John F. Clark, member of the assembly from Essex County. In spite of the fact that the bill was ably championed by Mr. Clark, it met with defeat, but only, I believe, on account of the condition of the state finances, which precluded the possibility of the State entering upon any new enterprises for the present.

The bill (assembly bill No. 9) provided for commitments as follows:

A patient may commit himself either by applying directly to the superintendent of the institution or to the courts; patients who refuse to commit themselves can, provided they are inebriates as defined in the act, be committed on the certificates of two physicians in the same manner as the insane are now committed in New Jersey; and a committing magistrate may, at his discretion, commit to this institution persons convicted of minor offenses if the offense be due to alcohol or drug using.

In an article entitled "The drink habit and its treatment," which I read before the Medical Society of New Jersey, I called attention to the fact that the drink habit can be cured in a gratifyingly increasing number of cases without requiring the detention of the patient, provided that the treatment is begun in the early stages of the disease. In view of my convictions, I have provided in the bill that the superintendent of the hospital may, at his discretion, treat without detention persons who voluntarily apply for such treatment if, in his judgment, they are suitable patients for such treatment. I have done this in order to make it possible to reach that large number of patients who are in the early stage of the disease and who will not voluntarily place themselves under restraint, and who can not be committed by the courts because they have not advanced to the stage when they can be included among those persons who are termed "inebriates" within the meaning of the act. The bill says:

The term "inebriate," as used in this act, includes every species of inebriety, and extends to every person who is suffering from inebriety, whether caused by the periodical or habitual excessive use of intoxicating liquors, morphine, opium, cocaine, chloral, or other narcotics, and who, as a result of such excessive use of intoxicating liquors or narcotic drugs, has become incapable of controlling himself or his estate, or is wasting his estate, or is a menace to the public weal.

All patients are committed to be detained until they are cured or discharged or removed by law, but no person can be detained for a longer period than two years without being permitted to leave on parole.

At the present time there is in New Jersey only one way in which an inebriate who is drinking himself to ruin or death and who is a menace to himself, to his family, and to society, can be placed under legal restraint if he is not convicted of crime or is not insane, and that is under the provisions of the habitual-drunkards act.

Under this act an habitual drunkard can be committed to an insane asylum, but chancery proceedings are required, and the cost is several hundred dollars. This act is therefore available only to those possessed of worldly goods. To send to an insane asylum an inebriate who is not insane is, however, to say the least, a great error, for the tottering mind of the inebriate is easily and readily rendered more unsound by contact with the insane, and such a man on the border line of insanity can soon become insane, a curable patient becoming possibly incurable.

Left to himself the inebriate is practically helpless and hopeless. The disease is progressive and gets worse as time goes on. Under proper treatment the outlook is as hopeful as it is in almost any other chronic disease. Insanity, long thought to be a condition devoid of hope, has yielded marvelously to scientific treatment, and we are more than justified in the light of modern progress to expect likewise marvelous results from the rational treatment of the inebriate. Hence this plea.

THE PSYCHIC TREATMENT OF ALCOHOLIC INTEMPERANCE BASED ON A PERSONAL EXPERIENCE WITH 1,000 CASES.

By JOHN D. QUACKENBOS, A. M., M. D.,

Member of the London Society for Psychical Research; fellow of the New York Academy of Medicine; member of the New York Academy of Sciences; fellow of the New Hampshire Medical Society; member of the New York Medical Association; member of the American Medical Association; member of the American Association for the Advancement of Science.

I have been requested to discuss before you this evening the treatment of the drink habit by hypnotic suggestion, and I shall consider the question with reference especially to the technic, the class of cases that are amenable, time limits of treatment with general results, and permanency of cure.

The phenomena of suggestion are explicable on the theory of simultaneous self-manifestation in two distinct worlds of consciousness—a theory now generally accepted by psychologists. These are distinguished as the objective or supraliminal, the world of everyday waking life; and the subjective or subliminal, the world of sleep, in which the immaterial part of the man employs itself without corporeal restraint. The subliminal, superior, or better self—the pneuma or spirit of the New Testament—is that deathless entity that constitutes the true or “inner man” a vast spiritual organism, the created copy of God, and as such measurably endowed with divine attributes and powers. The objective self is an expression, imperfect and partial at its best, of this subliminal through “the flesh,” that is, organs of body and faculties of mind. Now the possibilities of a psycho-dynamic control of the objective life by this higher self are practically boundless, and the whole purpose of hypno-suggestion is the establishment of such control, either where it has become relaxed or in fields where it has not before been exercised. So long as the subpersonal mind quickens sound organs, all defects or irregularities in the fulfillment of their functions may be remedied by assumption of the natural psycho-physical regulation, and so diseases that are not organic are curable by appeal to the subliminal self which orders organic life. Still further, all attitudes of the objective mind—its trends of thought, opinions, beliefs, desires, propensities, tendencies, emotions, and passions—are controllable and alterable by this higher human personality, exclusively along lines that are moral and true. And suggestion is nothing but a straightforward, heartfelt, forceful appeal to this personality, the source of spiritual energy in man’s being. It is of the nature of creative communication, a calling forth into overpowering action of the god part of the man—action that carries all before it in the earth life—all tendency to deviation from the

normal type, physical, intellectual, moral—even the objective will itself, iron though it seem to be.

Man, then, in his higher personality, is adequate to the extirpation from his objective nature of any abnormal craving or passion, like the craze for intoxicants. The latter is singularly responsive to treatment by suggestion. In fact, many of the popular drink cures are in reality mere suggestion cures, there being no peculiar virtue in the drugs administered, as there is no specific for the cure of drunkenness. The temporary success occasionally met with is due entirely to suggestive action on a susceptible patient anxious for relief. The fascination of mystery plays its part in the process, and thus the charlatan differs from the regular physician who operates on the psychic centers with the full consent and knowledge of the patient.

The notable increase in the consumption of stimulants, especially among the upper classes, estimated at 10 per cent, during the last decade in the case of men, and a much larger percentage in that of women, is inviting anxious attention to a means of treating the victims of alcoholic inebriety, for which so much has been claimed in this country and abroad. Upward of one billion dollars are spent annually in the United States for intoxicating drinks, and another billion for the relief of the destitution, the punishment of the crime, and the care of the physical and mental diseases that result directly from the drink habit. Especially alarming is the growth of the practice among our women. The punch bowl figures at all functions, and proud-pied matrons dip freely therein, ten drinking to-day where one drank a dozen years ago. School misses and college girls are conspicuous among the throng. Such has become the vogue; and, worse than this, girls in their teens see no impropriety in drinking publicly with men companions.

Not a few women have lapsed into the drink habit from the use of patent medicines containing large percentages of alcohol. Many a clergyman can date his downfall from his first dose of Jamaica ginger. The step from "disguised boozes" (upon which \$75,000,000 are annually expended) to whisky, their main constituent, is more than easy.

Even school children are becoming beer and wine drinkers, especially those of foreign parentage, and the increasing prevalence of this habit is leading to a mental sluggishness, if not defect, among the pupils of the public schools that is attracting the attention of educators and philanthropists. In few the prevalent wholesale addiction to the use of alcoholic stimulants—with its accompanying degenerations of kidney, brain, heart, liver, stomach, and arteries; its pernicious influence in the causation of pneumonia and tuberculosis; its direct action in diminishing nervous resistance, and so increasing the mortality rate in the case of all diseases; the part it plays in the induction of insanity, one-third of all mental affections being due to its abuse; and its tendency to transmit to offspring not only epilepsy and mental defect, but marked degeneracy and criminal propensity—is assuming proportions so appalling that it may justly be regarded as perhaps the greatest existing menace to the stability of American institutions.

Moreover, the rank and file of the drinking population are swallowing a poison far deadlier and more rapid in its action than genuine ethyl

alcohol. This fact is ignored by the temperance reformer, and often by the physician. The consumption being greatly in excess of the ability of the brewers and distillers to produce wholesome beverages, notorious adulterations are resorted to. About 50,000,000 barrels of malt liquors represent the yearly output of the United States. Much of this, to meet the demands of trade, is sold when new and imperfectly fermented, and a great deal of sickness is the result. Besides, the beer drinker has to run the gantlet of various preservatives, especially formalin, with its destructive action on all the organs; of artificial bitters like salicin, picric acid, quassia, strychnia, and aloes; even of arsenic derived from sulphuric acid made from arsenical pyrites, and used in the process of manufacture to convert the starch into glucose.

Intoxicating liquors are as liable to adulteration; but it must be conceded that it is the raw alcohol as well as the admixtures that causes the chronic catarrh of the stomach, the Bright's disease, the arterio-sclerosis, the palsies and ataxias, the nervous bankruptcy, and the moral degradation of the dram drinker. Good rum as well as bad rum will, when used to excess, gradually convert the different organs and tissues of the body into specimens of degeneration and disease. Bad rum is more prompt in its action, and almost all the rum that is retailed is bad, the alcohol being made from corn, roots, refuse molasses, and even sawdust converted by acids into a fermentable sugar. It is the practice of the liquor dealer to stock his cellar with casks of crude grain or potato spirit liberally tintured with fusel or grain oil, an irritant poison. He then provides himself with a full line of laboratory-made essences—brandy essence (consisting of oil of grapes, acetic ether, allspice tincture, and alcohol), rum essence (composed of butyric ether, acetic ether, vanilla tincture, essence of violets, and 90 parts alcohol), gin essence, hot-drop essence, whisky essence, etc., and in accordance with the instructions of a hand book furnished by the essence manufacturer proceeds to make from the same barrel of crude grain spirits, by the addition of the prescribed quantity of the several essences, what he advertises over his bar as pure liquors. The same barrel gives birth to Bourbon, rye, wheat whisky, malt whisky, Scotch and Irish whisky, Jamaica and Medford rum, Schiedam-schnapps and Old Tom, cherry, peach, apple, blackberry, and Cognac brandy. The cost of the amount of essence required to manufacture in this way 120 gallons of Cognac, 160 gallons of gin, 40 gallons of any kind of rum, and 160 gallons of any kind of whisky varies from \$3 to \$4.

Such are the cheap artificial imitations of distilled spirits, the frightful compounds of fusel oil and whisky essence, the saloon keeper palms off with impunity upon the habitués of his cabaret. Properly matured ethyl alcohol or unadulterated whisky, itself a protoplasmic poison, is hardly obtainable in an American barroom. Of every hundred drinks sold in the United States as whisky to-day, only one is really whisky; but so clever is the counterfeit that club connoisseurs have failed to detect it. Amylic alcohol, or the common whisky of trade (and it matters not whether it is dispensed by a bishop or a bravo), is the "death's river" setting in resistless current toward murder, robbery, misuse of women, paresis, and the asylum. Whatever moral, social, or legislative measures may eventually be adopted looking to the suppression of the drink habit, we are in urgent need of power to restrain in appropriate institutions

the habitual drinker of these poisonous spirits, who is, under the present conditions, a danger to himself, a curse to his family, and a nuisance to the state.

The following case of a gentleman who drank whisky is representative both of the alcoholic disease and its causation, and of the method pursued:

Four years ago Mr. A., who had vainly resorted to the popular drink cures, was induced by his friends to make trial of psychic treatment. Beginning as a college boy to carouse with his mates, engaging in contests to see who could drink the most beer in the shortest time, he passed successively through the stages of occasional use for convivial reasons, frequent indulgence to brace him for task or pastime, periodical paroxysms of alcoholic debauchery, until at 40 he found himself a continuous drinker impelled by an irresistible and insatiable craving, with marked stigmata of degeneration and a growing incapacity for professional duty. His wife and daughters, for years subjected to constant humiliation at his hands, had come to feel the pinch of want, and smarted under the construction placed upon his actions by a merciless society. Affection had died in his heart, and with it both self-respect and religious sense. In such a case at least a year is usually required of forced feeding and restricted activity to repair the damaged brain cells and so restore the patient to normal efficiency. But within a week the mental attitude may be permanently changed and the craving for stimulants obliterated, without experience of the nervous exhaustion and unrest that usually accompany discontinuance of the habit. Since his first séance (now six years ago) Mr. A. has experienced no desire for alcohol. The suggestion was given that he would no longer deceive himself with the thought that he could safely take one drink and then stop, but that it was impossible for him ever to want a drink or ever to take a drink for any conceivable reason. He has abstained not through conscious effort, but spontaneously, because of an ingrained disinclination to drink, conditioned by subpersonal control. In this instance it was further necessary to forbid the use of tobacco, the inhalation of which in the form of smoke, by depressing the nerve centers and thus creating an imperious demand for its antidote (whisky), explains 75 per cent of all the cases of methomania. The chain of cause and effect was broken at a blow. The patient neither smokes nor drinks; and he has made amends for the suffering he inflicted on his family by exalted action meriting their respect and love.

In contrast with the foregoing is the following extreme case of chronic poisoning by adulterated liquors excessively indulged in between the ages of 16 and 37.

Every Saturday night W. B. drinks to intoxication, and commits other excesses that fill his mind with remorse, so that his condition borders on theomania. He imagines the people riding on the car with him know all that he has done, and that the children on the street are cognizant of his misdoings and are calling him names significant thereof. He is afraid of everything. He suffers from hallucinations of vision. A woman with a baby carriage is forever following him. He sees green flashes in the dark and men going through various motions. Flies attend him everywhere, hovering about, showing him how to use his tools, etc. He does not know the difference

between a real and an imaginary fly, and continually shoos the latter variety. Three separate voices talk to him, coming up the dumb-waiter shaft or speaking through the window. They never desist, even while he is at work, and at times seem so real that he looks around to see who is speaking. One voice will keep repeating some message, laying stress principally on his sins. If he is reading a paper, it reads ahead of him. Three years ago his mind gave way, and he took a flatiron and went upstairs to kill a man who was calling him vile names, the man being perfectly innocent. He rallied from this seizure, but returning to his fusel oil he has become subject to melancholy spells and to attacks of amnesia, so that he loses his sense of identity for days at a time.

This is not a common case of "three sheets in the wind," but rather of a noble brought to ninepence through incurable degeneration of the brain. There is no hope for such a victim in mental thereology.

By means of the enlightened employment of hypno-suggestion the subliminal self of the ordinary inebriate may be placed in control. So it is no longer a valid argument for a man to hold that he gets drunk because he can not help it. Statistics show that the treatment of alcoholic subjects by suggestion (in this country and abroad) gives at least 75 per cent of radical cures. All other known methods have never given more than 30 per cent.

Dipsomaniacs, as a rule, are easy subjects, in that they yield readily to the hypnotic influence and accept unconditionally the suggestions communicated by the operator. Regular drinkers may be dealt with whenever they can be induced to sober. Periodic drinkers should be treated just before the close of the cycle of sobriety. Regularly recurring debauches have periods of varying length, the longest in my experience being three years; and I have satisfied myself that in many instances a relationship exists between the abuse of tobacco and the oncoming of the irresistible thirst, the depressing effects of the nicotine instinctively suggesting recourse to the antidote. Periodic drink storms are usually forecast by significant indications well known to the family and friends of the victim—irritability of temper, unreasonable suspicion, so-described "cranky spells," abnormal restlessness, unaccountable depression. Immediately upon the appearance of these symptoms the patient should be treated by suggestion before opportunity is given for indulgence of the craving. Such a subject frequently recognizes his danger and sincerely wishes to be cured. He is tactfully conducted into the subliminal sphere, and then assured that, in accordance with his own desire and decree, he has lost all craving for beer, wine, whisky; that alcohol in any form is repugnant to him, and as a safeguard that he can not swallow it, can not carry the containing glass to his lips. The society of low companions is tabooed; the pleasures associated with drink and the glamour of the barroom are pictured as meretricious and placed in vivid antithesis to the chaste delights of home life. The physical, mental, moral, and economic bankruptcy that accompanies dipsomania is held up before the view of the sleeper, and he is forced to the conviction that begotten of this apprehension has come into his soul an abhorrence for drink and all that it stands for. He realizes the presence of efficiency within him adequate to the enforcement of radical abstinence as the principle of his life; and he is rendered insensible for the future to any

such combination of passion and allurements as has usually constituted temptation. So he is led instantaneously to scorn recourse to alcoholic stimulants, or to extrinsic exaltation of any kind, either for convivial reasons or in time of depression, misfortune, or sorrow, and to depend exclusively, under any mental or physical strain, on the units of energy legitimately manufactured out of nutritious food, nonintoxicating drinks, air, exercise, and sleep. The subpersonal mind is then directed to the vocation or the avocations, or both, as circumstances suggest, and a career of wholesome activities and satisfactory success is imaged as the legitimate result of the abandonment of the compromising habit.

Hypno-suggestion here is clearly of the nature of inspiration. It is a summoning into control of the true man. For the patient freely expresses his best self post-hypnotically, without effort, from a plane above that of the will—the plane of apprehension and spontaneous command along lines of thought and action that are worthy and wholesome. And inspiration, to be efficacious, can not be mere lip work or rote lesson. It implies a belief in the suggestions offered, an eloquent and incisive manner born of the courage of conviction; in short, it is a transfusion of personality. Perfunctory speeches are of no avail, for the mind of the subject is endowed with supranormal insight, at once detects the disingenuous, and declines impulsion at the hands of an insincere or lukewarm operator.

A *sine qua non* of success is the consent of the patient, an honest desire on his part to reform. Habitual drinkers, those who "soak," as Goldsmith described it, do not, as a rule, wish to be cured. They enjoy indulgence in alcoholic beverages and the false pleasures that attend it; and about 90 per cent of them, women as well as men, resent the approaches of those who desire to save them. Sometimes, when no other form of appeal is effective, they may be frightened into a realization of the fact that constant use of alcoholic stimulants will result in organic changes in the liver, kidneys, and brain, or by lowering the general powers of resistance and at the same time irritating the bronchial tubes and the lungs, through which the alcohol is in part eliminated, markedly predisposes to pneumonia and tubercular consumption. In fact, immoderate drinkers may, in sober intervals, be made to realize, not only that they are physically depraved, but intellectually degenerated as to the faculties of memory, attention, concentration, judgment, and that they are deficient in business tact and in the general address essential to success. Once apprised of their enervated mental condition, they are overcome with remorse and honestly desire to correct the habit. Under these circumstances it is comparatively easy to persuade a patient to accept treatment, and a rescue may be effected in a week's time. To quote a Hindoo proverb, "In the awful silence that follows the storm, not in the silence before it, we should search for the budding flower."

No reference is here intended to dipsomania as a true circular insanity, characterized by irresistibly compelling paroxysms of thirst and accompanied with uncontrollable nervous and mental excitement. It has been truthfully said that a sufferer from this disease is insane before he begins to drink, and would continue to be insane during this period if whisky were unobtainable. Thus there may be dipsomaniacs who have never tasted alcohol. The alcohol is a secondary factor.

In other words, a man may drink because he is crazy, or be crazy because he drinks, or both; and a physician who grapples with the combination has a veritable wolf by the ears.

It is not claimed that the tendency to relapse is absolutely obliterated by suggestion. The cure may or may not be permanent, as is the case with rheumatism, quinsy, bronchitis, intermittent fever, with its distinct germ, and distinct specific. No physician is asked to guarantee a patient against a recurrence of tonsilitis, especially when the patient deliberately exposes himself to the appropriate conditions for a relapse. More can not be expected of the physician suggestionist, who is not a miracle monger. The utmost he can do in a prophylactic line is to reject all compromises in his treatment, suggest total abstinence, forbid exposure to temptation, and render insensible to the psychology of the saloon. Experience proves that it is always better to deal in drink-habit cases with the nearest of kin rather than directly with the patient, who naturally overestimates his power of resistance and is singularly impatient of restraint. Courting a conflict with the demon of drink, as many do, is playing with fire.

Various reasons are advanced by backsliders to explain their relapses, and some of them are most trivial, as the death of a favorite dog, dull times, inharmony in the family. Some drink when they feel best, others when they feel worst, some others because they deem it a satisfaction to "go off on a tear and tank up." One man used the argument that he had gone sober so long he was justified in a debauch. A lady admitted her motive to be the delight she experienced in drinking with her admirers and listening to their flattery and compliments. Another lady, with a much greater show of reason, explained her periodicals as due to the cumulative brain fog resulting from a miscellany of little worries. Here, as in many similar cases, alcohol serves to obscure fatigue or cell exhaustion, which, if so treated, must end in neurasthenia or irreparable brain damage.

Many drink to dispel the blues, to induce sleep, to rouse courage or confidence.

A very intelligent inventor offered four reasons for indulgence, viz, requirement of the system in consequence of physical depression, sociability, business necessity, and cold blood or "pure cussedness." Sometimes the drinker has no object in view, but seems to be actuated by a sense of obligation to a long-standing habit, periodical conformity to which is fraught with discomfort and misery. The psychology of this latter mental state is illustrated by the following experience of a friend, who, a summer or two ago, met a farmer acquaintance on the public highway, trudging along to a near-by village. "Where are you bound for, Uncle Billy?" he inquired, in a spirit of neighborly bonhomie. "I am going into Johnstown," was the reply, "to get drunk, and O Lord! how I dread it!"

I have already stated that 75 per cent of inebriates are abusers of tobacco, and that in this latter abuse is to be found the proximate cause of much alcoholic intemperance. The real danger to the smoker consists in the habit of inhalation, whereby the volatilized poisons of tobacco are brought into immediate contact with many hundred square feet of vascular air-sac walls in the lungs, and are thus promptly and fully absorbed, to be diffused into the blood and carried on their fatal errand to the several organs of the body. Young

subjects immediately learn to inhale. They are, moreover, markedly susceptible to the influence of tobacco poisons. Gravest of all the resulting evils is the lessening or complete loss of moral sensibility, with a conspicuous tendency to falsehood and theft. The moral propensities are eventually destroyed because of the destruction of those elements of the brain cells through which moral force is expressed. The victim degenerates into an unmanly, unprincipled, irresponsible doddy-poll, in splendid fettle for the penitentiary or the madhouse.

The circulation through the brain of tobacco smoke poisons and alcohol destroys the capacity for expressing through that brain earnestness and sincerity in efforts to reform. Fortunately the damage done to the cells is reparable by the discontinuance of the toxins and the judicious administration of nourishment, general and specific. While hypnotic suggestion may regulate a disturbed metabolism in the nerve organs or check atrophic changes in cell protoplasm, it can not be expected to repair lesions in the blood-vessel sheaths or suddenly atone for the results of an exaggerated destructive metamorphosis in the nerve-cell bodies. Therefore, in my treatment alcohol is immediately withdrawn, stimulating liquid food is given every two hours for a day or two, and the phosphor-glycerates, representing true brain aliment, are administered for six months to a year, with a view to refining the quality and increasing the quantity of the lecithin through which resolution and general manliness are expressed. In the insanity of extravagant drinking, coupled with chronic nicotine poisoning, suggestive treatment may sometimes be delayed with advantage until after the compulsory reduction or withdrawal of the artificial stimulant. Patients who, to rid themselves temporarily of the importunity of relatives, accept an institutional life, with mental reservation as to their habits at the termination of the period of treatment, are proper subjects for suggestion while in sanatorio. "The tongue has taken the oath, but the mind is unsworn." Under such circumstances, with the craving in lull the subliminal self may be successfully impressed.

The success of the treatment outlined above bears a distinct relation to the amount of injury already inflicted upon the brain cells and the accompanying mental deterioration. Its advantage consists in the rapidity of restoration to self-control without the necessity for effort of will, without the physical discomfort or suffering that usually attends abandonment of the habit, and most conspicuously without the breaking of family ties and the enforced absence from professional or business duties that are implied in sanatorium treatment.

The views here advanced are based upon an experience with some thousand cases of alcoholic intemperance extending over a period of ten years. Of these, between 80 and 90 per cent have been permanently cured. Of the remaining 15 per cent a number can not be traced; a number indifferently submitted to one or two treatments out of deference to the entreaties of friends, and hence there was no objective self-surrender; a few had become paretic before the treatment was begun; a small fraction were society women, who, in my experience, are almost without the pale of hope. In no other condition that I have been called upon to treat by suggestion am I so unreservedly warranted in saying to the sufferer, "If you sincerely desire to be cured of this malady and will carry out my instructions faithfully for a year, you can be cured beyond a peradventure."

HYDROTHERAPY AND ELECTRICITY IN THE TREATMENT OF ALCOHOLISM.

By Dr. J. C. WALTON,

Proprietor of the Hydro-Electro-Therapeutic Sanatorium, Richmond, Va.

We all painfully realize the evils of alcoholism and extend our sympathies to the unfortunate victim and his dependents, but help as well as sympathy is what the situation demands.

Modern medicine made a great advance when it recognized alcoholism as a phase of disease instead of as, formerly, regarding the alcoholic as a malefactor and as one who could reform if he would but make an earnest effort. Now it rightly regards him as one suffering from a diseased condition which has incapacitated him mentally and physically, whose system is poisoned by overindulgence, non-elimination, and who in addition to all this may be the victim of heredity and environment.

It necessarily follows, therefore, that the first step in the management of the alcoholic is to ascertain what is wrong, to correct the same, make a careful physical examination and try to discover the underlying causes, physical and mental, and if possible to remove them, convince him that you are his friend and are anxious to help him in every possible way.

Place him in a quiet, well-ventilated room, with a trustworthy attendant who will see that your instructions are faithfully carried out; remove stimulants as rapidly as safety will permit, as his tissues are already poisoned and saturated with alcohol, and eliminate the poison as rapidly as circumstances and the condition of your patient will allow; see that he is made comfortable and gets plenty of sleep, even if you have to resort to sedatives to produce sleep. As a general rule a hypo of morphia and atropine fulfills this indication better than any other hypnotic. At the same time give a brisk mercurial purge so as to thoroughly empty the *prima viæ*, this to be followed by tonic doses of infusion cinchona—2 ounces every few hours.

A daily Baruch bath for its eliminant, tonic, alternative, and refreshing effects upon the entire organism, with the electric-light bath followed by douches. The writer's experience agrees with Crothers as to the results of the electric-light bath and finds it one of our most trustworthy agents for the relief of the distressing symptoms of drug and alcoholic addiction, the elimination of both solids and water is largely in excess of that from the heat or steam bath, the depression much less with a marked calmative action greatly relieving the thirst, insomnia, and nervous depression. The sygmographic tracing also shows a reduction of 10 to 20 millimeters. The patients

are more easily brought under the influence of drugs, much smaller doses acting better than larger sizes of the same drug before the bath. When we reflect that the electric-light bath contains chemical as well as heat rays, we are not surprised at the results.

Static electricity with hydrotherapy make an ideal combination and fulfills every indication. It should be used once or twice daily—the morton wave current from a 16 to 20 plate static machine, twenty-minute seances—with as long a spark gap as the patient can comfortably stand, enough to produce good and strong vibrations. It is best applied by means of a flexible metallic electrode $3\frac{1}{2}$ inches wide and long enough to cover the entire spine from the occiput to the coccyx.

This treatment gives the most striking and remarkable results, and after the first treatment the patient clamors for more, the effects being decidedly tonic and sedative, relieving nervousness, producing sleep, and a general feeling of well-being and comfort, and thereby rapidly restoring to a normal condition.

Time and an extensive experience have convinced the writer that the treatment briefly above outlined is sensible and rational and that it comes nearer meeting the indications and overcoming the various morbid conditions encountered among the alcoholics than any other methods of treatment. I will report a typical case in closing.

Mr. A., age 50, head of a large corporation, was admitted to the sanitarium last January; had been drinking heavily for the past few years, and had taken the Oppenheimer and many other so-called cures; general condition bad, and he was a picture of abject misery. Enlargement of right lobe of liver, nausea, insomnia, and could not write his name on account of muscular tremors; was ordered Baruch baths with the electric-light baths and static electricity. Improvement prompt and decided; left the sanitarium after a week's stay and returned to his business, signing over 100 checks on the sixth day of treatment. His wife called at the office on the eighth day to thank me for this wonderful transformation and to assure me of her appreciation and gratitude, and this was really the most satisfactory part of my fee.

This short treatment started this man well on the road to recovery. We all are well aware that a case of this kind requires prolonged care and treatment, with constant supervision for weeks or months in order to make the cure a permanent one.

Patient, after leaving sanitarium, continued treatment by taking Baruch baths and static electricity on alternate days, and still holds out faithfully three months after leaving sanitarium although his business necessitates the strenuous life.

In those cases of alcoholism complicated with chronic nephritis and an arterio-sclerotic condition of the blood vessels, the Darsonal or high frequency currents administered once daily, twenty-minute seances, the patient lying on an autocondensation couch, connected with the Darsonal apparatus, which is excited by a large static machine, 16 or 20 plates, running at high speed. This treatment gives the most happy results, increasing the urinary secretion, both solids and water, and raising the specific gravity, lowering arterial tension, improving the general condition in every way, and, all in all, will come nearer restoring a normal condition than any other procedure with which I am acquainted.

PAPERS RELATING TO THE ALCOHOLIC PROBLEM
IN ITS SOCIOLOGICAL, PHYSIOLOGICAL, AND
MEDICAL ASPECTS.

THE ALCOHOLIC PROBLEM IN EVERYDAY LIFE.

By HOWARD A. KELLY, M. D.,

Professor diseases of women of the Johns Hopkins Hospital, Baltimore, Md.

I take it as my privilege, speaking on this first day of the session, to avoid entering into any of the minuter scientific discussions which will naturally follow in our programme, and to address myself somewhat generally to the topic, hoping that I shall be able to voice the mind and give expression to the sentiments of the thoughtful medical profession of the country. I take up therefore the question of alcohol as it has gradually crystallized itself in my mind as a result of unnumbered experiences—experiences, which, though rightly counting for the validity of a positive judgment, have not been filed away in any available written records. It is true that in this way, too, prejudice may be fed, but I feel sure the best judgment the world has to bring to bear upon its problems, affecting our deepest and most sacred interests, are constantly formed by this less laborious process.

I feel unwilling to take up my subject, brief as it is, without first voicing the sentiment of this assembly and of tens of thousands of others who are not here, in expressing my thankfulness for the recent articles which have appeared in the press since last fall, notably in McClure's Magazine. These articles seem to me to include all we need for campaign purposes; they are scientific, authoritative, brief, pointed, available to everybody, and convincing. One of my friends who instructs the boys in the high school in Brooklyn, N. Y., tells me she uses Dr. Henry Smith Williams's articles (in numbers for October, December, 1908, and February, 1909) in place of a text-book. If the liquor interest of the country with its fabulous wealth has nothing to say in rebuttal to these damning public accusations, we may well conclude the case is settled as far as good logic and convincing arguments can settle anything. I would also especially mention with a sense of thankfulness the articles of the Rev. Charles F. Aked and of the two Rosanoffs. Doctor Aked is, to my mind, a sturdier champion of temperance than he is of Christianity. We all feel thankful, too, do we not, for the confessions of the New York saloon keeper, which throw a lurid light on the abominations which corrupt this business—root, stem, and branch—through production, distribution, and consumption.

Professor Münsterberg, too, has helped us by demonstrating the feebleness of the position of the moderate drinker whose cause he champions. He renders also a real service by showing the difficulties in the way of making prohibition effective; let us not minimize them. At such a time as this, in the flush of success, we may

well ask whether it will not be wiser to pay closer attention to the objectors.

He asks these pertinent questions, which we dare not brush lightly aside: Does prohibition really prohibit? Are we ready for prohibition?

If we adopt prohibition before the whole public is ready for it, will we put a premium on lying and tempt our people to evade and despise the laws of the land?

I am thankful for Professor Münsterberg's article, as it is the strongest presentation on the side of the defense.

In this brief tribute I would not omit to thank also the Ladies' Home Journal for its letter from President Eliot, of Harvard College, and for the opening paragraph of a paper by Professor Münsterberg, in other respects a disappointing production.

The cause of good morals in this land would be greatly aided if the daily press were equally courageous and aggressive. To what daily paper can I look for an invariably candid, strong expression of opinion touching every great moral issue? One or two great New York papers would come near meeting this want were it not for the frequent outcropping of bitterness and bias.

With regard to my own work, I speak (1) as a physician with thirty-two years' experience, dating from the beginning of my medical studies, and (2) as a citizen deeply interested in public affairs.

I began my practice in private life by prescribing alcohol in its various forms as an easily diffusible stimulant in cases of periodic weakness, in low fevers, and exhaustion, in accordance with the common custom of a generation ago. The physiologic argument was a simple and a short one. The patient is weak; she needs strength. What drug have we which will at once give the desired strength? Answer, alcohol.

Alcohol whips up flagging energy and produces an appearance of a temporary improvement; therefore give alcohol as a tonic at intervals until the patient is able to do without it. This was much like the fallacious argument which appeals so often to the relatives of a patient: "When Mary was well and robust, she had a good appetite; now she is sick and she has no appetite. Doctor, please give her a prescription to give her an appetite, and we know she will be well again."

My medical experience has taught me that the effect is temporary, evanescent; that the drug (for such it is) does no real good, and that a dangerous habit is thus easily engendered which may be most difficult to eradicate, a habit which may utterly ruin the patient—body, soul, and spirit, making it far better if she had died at once of her disease while under the doctor's care.

It is clear in the light of experience and of recent research work that alcohol ought to be classed in the list of dangerous drugs along with morphine, cocaine, and chloral, a drug which may so affect the will power as to gain the complete mastery over a patient, and in the end destroy him.

English and German physiologists have since that period, twenty-five years ago, demonstrated beyond a question that the continued use of alcohol in any quantity is not only useless, but positively harmful, and on the basis of experience I appeal to my colleagues everywhere to abjure its use.

The fittest uses a doctor can make of alcohol are to preserve dead tissues, cancers and the like, and to dehydrate sections of tissue for the microscope.

Those who drink constantly in so-called "moderation" often develop alarming symptoms, in time associated with diseases of a degenerative character affecting in the lines of least resistance one or other of the great vital organs of the body. In operations these factors demand careful consideration. In the prognosis they are as a rule more important than any other factor; a habit of "moderate" or excessive drinking lowers the vitality and lessens the reparative powers, so that serious postoperative complications are likely to follow and interrupt or even cut short the convalescence in such cases.

One of the most alarming effects is that observed in the arterial walls and in the heart muscle, which are weakened. The impairment of nutritive processes is another pronounced factor. All rational surgery and treatment of disease takes into serious account the question of the use of alcohol by the patient. This is science and not sentiment or theory.

As a citizen, with eyes opened perhaps a little wider because of my medical training, I observe that alcohol has destroyed the happiness and the lives of relatives, friends, and acquaintances; that it has sometimes served to degrade the noble-minded and the godly man below the level of the pig.

I have seen that it robs the home of peace; it puts a barrier between husband and wife and kills all true parental tenderness, throwing the children back into the world for that moral training a father and a mother are alone fitted by nature to give.

As a citizen, I observe with alarm an increasing tendency to its use by women in society, who take cocktails, champagne, and the various wines of the table. I have seen sweet, modest girls, flushed with wine, become loud and boisterous, and, with habitual indulgence, coarse, and at last ruined morally and physically. I have never met a man or a woman who indulged freely who loved the truth or had any clear vision of the value of spiritual things. Its use is perhaps the commonest cause of spiritual blindness.

As a citizen I further note that it is one of the most dreadful and insidious of all corrupting agents known to men in debauching legislatures and robbing our citizens of the results of their labors at the ballot box, making a government of the people, by the people, for the people a farcical phrase, while king alcohol sits enthroned in the legislative hall.

As a citizen I note that it is alcohol which fills our prisons, whether taken in the form of a stronger beverage as whisky or beer as a representative of the milder beverages.

It is at the bottom of most crime—domestic infelicity, poverty, seductions, murders; it is allied to all that is evil and destructive of the high aims of civilization.

One of the greatest lessons life has taught me is that great truths grow not stale but sweeter with repetition, so I do not hesitate to remind you of certain things, though you know them. I therefore pause a moment as I approach my conclusion to consider some of the common arguments against total abstinence urged by a friend of mine a few days since as we discussed this momentous topic. First and foremost stands that time-honored assertion so often heard on the lips of the drunkard as well as of the moderate drinker: "It is a

sign of weakness to pledge myself to abstinence. My will is strong enough; I can control myself; I can quit when I will." It seems to me, I replied to my interlocutor, that the best answers to arguments in the realm of morals are the facts, and here they are undisputed: Out of all the drunkards and the tens of thousands of criminals made what they are by alcoholic liquors, of the thousands who fill our insane asylums and the tens of thousands of dependents in our poorhouses, it would be hard to find one not equally assertive of the sovereignty of his will in all his acts and of his entire ability to take liquor or to let it alone, as he might choose, when he started out.

It is pitiful to hear now and then even a poor, debauched drunkard, with one foot slipping over the edge of the grave, still reiterating this same old worn-out phrase. I think I still hear the last feeble refrain as he topples into the grave, "I can—" but all who pitifully watch him know that he can't. What a peculiarly damnable trait it is in alcohol, that while it is literally destroying the highest centers in the brain and wiping out the fibrils of association so necessary to the will in forming a judgment to act or to restrain it yet deludes its victim into thinking that he has quickened powers, a stronger will, and a better judgment. Those are interesting experiments cited by the Rosanoffs and adverted to by President Eliot of Harvard in his paragraphs in the *Ladies' Home Journal* (March, 1909), where the typesetters were tested with type-written copy under moderate drinking and after abstinence, when it was found that while they often thought they were doing more work under the influence of the drug in reality they were doing far less. It is evident from these experiments that a liquor-imbibing nation assumes a heavy handicap in the race for industrial supremacy.

I hear the makers of alcohol, at last roused by the prohibition wave, crying out that they stand for its moderate, not for its immoderate, use.

In reply to this I answer that if they make it and sell it the use is practically beyond their control, and that their plausible declarations are as light as the paper on which they are written, and can in no way affect its use, whether moderate or immoderate. I further inquire why these gentlemen have been so long in reaching this benevolent conclusion. I declare that I believe their contention and their expressed desires are specious and false, and, further, I aver that, judging by such scientific evidence as we now have, there is no such thing as a moderate use of alcohol.

If it is "a sign of weakness to be a total abstainer," I hasten to confess my weakness, and I confess it for all who are dependent upon me; would that I might also make confession for the whole world. We are no stronger than many of the thousands of bright young men and fine women who thought they were strong and found out their weakness only too late.

"It conduces to conviviality." So it does, but of what kind? We have a word in our language which describes this conviviality in all its phases, from the sparkling eye and the loosened tongue and the ready repartee, all the way up the gamut to the dull, stammering speech and the disgusting caresses, perfumed with exhalations of stale liquor, and that word is "maudlin."

Under all circumstances when a man talks to me and I lend him my interested attention I want to know that he means what he

says. Alcoholic talk robs speech of all moral force. God grant that no alcoholic conviviality may ever enliven the board at which I sit with friends or family.

"To condemn alcohol by not taking it in company makes one appear a faddist." Well, that may be said of everyone who opposes sin in any of its forms. It is hard to go against common practice, but it is one of the hard things that puts moral fiber into one, and that's the best thing we have in life.

Some recent clippings may well serve to show the attitude of leading minds of the race toward this great question.

Professor Münsterberg says of the saloon in the *Ladies' Home Journal* (March, 1909):

There is nothing more degrading and no more atrocious insult to civilized life than the American saloon. It has poisoned the social atmosphere for the masses; in it the workman squanders his savings, and the healthy man devastates his energies and becomes a wreck. Political corruption irradiates from the saloon into the whole public life, and a thousand ways lead from the saloon into the penitentiary. It is a blessed movement which now turns with overwhelming energy against the horrors of this evil and unites the clean minds of the whole nation in an untiring fight against this source of infection. There may be disagreements as to the best ways and means, disagreement whether strict prohibition or education toward temperance is the more reliable method; but there is no disagreement as to the fact that the saloon has to be wiped out, and the day seems near indeed when—thanks to women—the fight against the saloon will be taken up in almost every State.

Huxley was once asked what he thought of alcohol as a stimulant to the brain in mental work. His reply was prompt, unequivocal, decisive: "I would just as soon take a dose of arsenic as I would of alcohol under such circumstances. Indeed, on the whole, I should think arsenic the safer, less likely to lead to physical and moral degradation. It would be better to die outright than to be alcoholized before death. If a man can not do brain work without stimulants of any kind he had better turn to hand work—it is an indication on Nature's part that she did not intend him to be a head worker. The circumstances of my life have led me to experience all sorts of conditions in regard to alcohol, but on no conceivable consideration would I use alcohol to whip up a tired or sluggish brain."

Cardinal Manning said for the Roman Catholic Church:

I impeach the liquor traffic of high crimes and misdemeanors. It is mere mockery to ask us to put down drunkenness by moral and religious means alone.

I often wish this great church, with her unexampled control over great masses of our citizens, would speak out more in public about this and all the mighty moral issues which are stirring us to-day.

We sadly want authoritative utterances from this source from the hierarchy.

The public opinion of the day is thus well set forth in the *New York Tribune*:

Upon what does the liquor traffic depend? Upon debased manhood, wronged womanhood, and defrauded childhood. It holds a mortgage over every cradle, a deed written in the heart's blood over every human life.

My associate, Doctor Burnam, but a few days ago returning from Kentucky, sitting in the Pullman car with a number of traveling salesmen, was deeply interested on noting the changed attitude of this observant class of men toward this great problem. In the first place they themselves had no thought of drinking, while they were eagerly engaged in discussing the effects of the recent change in the laws of the State of Ohio, and the prospective changes of a still more drastic nature, to do away not only with the sale but with the manufacture of alcoholic beverages as well. These gentlemen stated that

in their own personal experiences, representing a diversity of interests, they had noted the greatest improvement in the tone of the communities they visited. One man remarked:

I used to see men coming to town to get drunk every Saturday night, and now, since the local-option law, these same men come in Saturday afternoon driving their wives and children in a wagon and buying the various necessities of life.

Another drummer remarked that in a group where there were a number of dry and one wet town the wet town was the only one that had not sufficient spirit (of the right sort) to support a baseball team; others observed a general improvement and elevation in the tone of the communities they visited, and coincident with this there was an improvement in their own business relations; they found the local-option towns better places in which to do business.

That which is by many considered the greatest movement in modern times, namely, altruism, is foreshadowed in the writings of Moses in Genesis 3, where Cain impudently asks, "Am I my brother's keeper?" As a result of this attitude we see him driven out crying, "My punishment is greater than I can bear."

He who confesses that he is his brother's keeper will let alcohol alone and will fight it as the deadliest peril that has ever threatened to engulf our race.

This is the age of great professions of altruism. A true altruism will indignantly reject as a beverage to be taken for pleasure that which can only be had at such an enormous percentage in the destruction of life and morals.

Finally, let me add that were this whole community to adopt at once the will of this assembly and to sweep alcohol from the land I would have no hope of any permanent betterment, unless with the movement there went that dependence on God through Christ to whom the Christian looks for all that is good and transforming and effective in his life. A real moral principle is transforming in its efficacy; mere repression is not transformation. Transformation is wrought in the soul when it stands consciously before God with the desire of seeing sin and dealing with it according to His will.

SUMMARY.

- (1) Alcohol is nonefficient as a food, a most awful, wasteful substitute.
- (2) May be classed as a drug and a poison.
- (3) Has no rightful position as a medicine.
- (4) Destroys individual, domestic, and civic felicity.
- (5) Increases taxation by filling prisons, madhouses, and work-houses.
- (6) Greatest foe to civilization in heathen lands.
- (7) Therefore could be wholly abolished with profit.
- (8) Therefore, as one of the human family, an individual member has no right to introduce into the household or use for his own pleasure even moderately that which may hurt even one other member or set at work an evil influence he has no well-grounded hope of controlling.

ALCOHOL BRIEFLY VIEWED FROM A MODERN STAND-POINT.

By B. C. KEISTER, M. D.,

Superintendent Sanitarium for Mental and Nervous Diseases.

In this age of scientific progress we are confronted by many important problems, the proper solution of which requires the most careful thought and painstaking investigation.

A few months ago it was the writer's privilege and honor to attend, as one of the official delegates, that grand scientific meeting held in this city (Washington), the International Congress on Tuberculosis, and to add his mite toward solving the great problem of eradicating from this country the curse of tuberculosis.

The great amount of good accomplished for humanity by this convention of liberal-hearted, broad-minded scientific men of the medical profession remains to be seen. But, judging from the progress already made along certain lines during the few months that have elapsed since the convention, we may reasonably infer that a general revolution is now in progress, and that the day is rapidly approaching when the curse of tuberculosis will be driven from the face of the earth.

We are to-day confronted by even a greater problem than that of the "great white plague," and the solution of which demands greater effort, deeper thought, and a more thorough investigation on the part of educated men and scientists.

We have here a curse in disguise, "a wolf in sheep's clothing," that is making shipwreck of no less than 150,000 homes in the United States annually, and costing the United States for crime, pauperism, insanity, etc., no less than \$1,884,027,982 yearly.

We have in the United States at this time about three million hard drinkers, who have been taught and made to believe that alcohol when taken as a beverage is a mild stimulant and pleasant tonic.

From the above data and a few scientific facts that will follow in this paper you may be able, with some degree of precision, to get a partial view of the landscape that now confronts us.

In approaching this great subject with its varied and complexing avenues, over which so many of our older writers have traveled and stumbled, I can not but feel my inability, as well as some degree of trepidation, in attempting to grapple with such a monster problem.

In our recent laboratory researches and clinical experience with instruments of precision in the scientific study of alcohol and its physiological action on the human system we find it rather difficult to reconcile our more recent findings to the theories and practices of our forefathers.

This, however, is quite natural when we consider the many disadvantages under which our older writers labored in not having the laboratory training and equipment that are so absolutely necessary to make the proper research and scientific study of this subject.

Recent investigation clearly disproves the old theory of alcohol being a heart stimulant. It no longer lays any claim to its supposed power of augmenting the heart's action, but, on the contrary, it slowly depresses the action of the heart muscle and ultimately paralyzes both the muscle and the delicate nerves of the heart. This paralysis of the cardiac nerves largely accounts for the acute dilatation and fatal failure of this organ in persons who have taken large quantities of alcoholic drinks.

The common practice of administering some form of alcoholic liquid as a restorative in cases of fainting is contra-indicated, and the deception should be discountenanced by educated people. This rule applies with even greater force to cases of shock. Recent investigations have shown that alcohol administered in any form aggravates the conditions resulting from shock.

When taken into the system in any form, either as a medicine in small quantities or as a beverage at regular intervals, it acts in a very deleterious manner on the blood circulation by its paralyzing effect on the delicate nerves that supply the blood vessels, causing the latter to dilate or expand, and thereby admit a larger supply of blood which is carried to the surface and outer extremities of the body, causing the heart to do an extra amount of hard pumping in order to keep the dilated vessels filled with blood.

This extra work on the part of the heart deceived our older writers and practitioners into the belief that this organ was stimulated by the alcoholic beverage, when in reality it was made weaker from overwork and the depressing effects of the alcohol on the cardiac nerves. Not only the cardiac nerves, but the great sympathetic system of nerves, are more or less affected by the anesthetic and narcotic influence of the alcohol. It is a recognized fact in clinical pathology that toxic doses of alcohol are capable of paralyzing the vasomotor center, and thereby causing dilatation of the blood vessels. Chloral is capable of producing these same results. Clinical observation confirms all this. And it is a fact that when this condition exists in a person who has been taking large quantities of alcoholic drinks he becomes very weak and pale, the arterial and venous pressure falls, and the heart receives an insufficient supply of blood; the pulse soon becomes soft and very rapid, and finally syncope supervenes.

These physiological effects of alcohol are more or less observable according to the quantity administered and the length of intervals between doses.

We also find by clinical and microscopic observation that by the constant but moderate use of alcohol a hardening of the walls of the blood vessels, which is soon followed by a thickening, due to an increase of fibrous tissue, which leads to a lack of normal elasticity and contractility on the part of the vessel walls. We then have a delay in the blood current, and finally a stagnation or stasis of the circulation. This condition may occur in any part of the body or in any of the organs, and is known to physicians as fibrous or fatty degeneration.

With this abnormal condition of the blood vessels in the brain, we may, on the slightest provocation, such as a sudden fright, a hearty meal, or anything that may cause undue agitation of the heart, have a rupture of a blood vessel, followed by paralysis or apoplexy. With this condition of the blood vessels of the liver and kidneys, we may have such a change in the functions of these organs as will give rise to symptoms that are equally as alarming.

These pathological conditions, according to microscopic investigation, are brought about by no other cause, old age excepted, than alcoholic drinking.

It is a true saying that "a man is no older, no younger, and no stronger than his blood vessels."

We have a most deplorable condition of the vessels, the cells, and walls of the stomach in persons addicted to the moderate use of alcohol, giving rise to the many and varied symptoms of dyspepsia, such as slowing the process of digestion by the destructive effects of alcohol on the pepsin of the gastric juice. It is claimed that one grain of alcohol is capable of destroying 800 grains of pepsin.

One of the well-known characteristics of alcohol is its power to extract water from any object with which it comes in contact, hence its deleterious effect on the blood corpuscles, which contain 79 per cent of water, also the gastric juice, which contains 97 per cent of water, the pancreatic juice, which contains 90 per cent water, the saliva, which contains 99 per cent water, bile, 87 per cent water, muscle, 75 per cent water, brain, 80 per cent water, etc. It extracts the moisture from the 5,000,000 little cells that supply the gastric juice to the stomach, and destroys the protoplasm of the epithelial cells of the lining of the stomach, and in so doing the functions of this important organ of digestion are almost obliterated. We find that the entire alimentary canal is more or less affected by this same destructive process; in fact, no part of the human structure escapes the destructive influence of this insidious enemy.

The brain and nerves being of a watery character (80 per cent water) renders them very susceptible to the influence of alcohol. The microscope shows that grave alterations take place in the protoplasm of both the nerve cell and fiber under the action of alcohol after it has been freely taken for some time. It is a well-known fact that alcohol is a powerful protoplasmic poison, it having a special selective affinity for the delicate cells of the brain and nervous system, with whose function and capacity it interferes even at a very early stage, and finally causing permanent gross alterations in the tissue, which are demonstrable to both the naked eye and through the microscope. A cell damaged in this way never recovers. It has been demonstrated by clinical observation that alcohol has been found pent up in small sacs on the brain in persons who have been chronic drinkers. It may be found in various quantities. "Enough alcohol has been repeatedly found in the brain of a dead toper to spoon out into an open dish and set on fire." We may have, as a result of this accumulation of alcohol, pressure on the brain substance, giving rise to such diseases as apoplexy, epilepsy, delirium, and insanity. The brain is hardened by the alcohol on account of its power of absorbing the water therefrom, causing a very marked disturbance in the transmission of thought and nerve force, impairing to a certain extent all the mental faculties. When we consider these

pathological conditions of the brain and nerves, wrought by alcohol, is it any wonder that we have such an increase of nervous diseases, insanity, epilepsy, feeble-mindedness, both hereditary and acquired?

Parental intoxication tends to produce impulsive degenerates and moral imbeciles. The brunt of the evil heritage caused by alcoholism falls upon the nervous system of the next generation. It may not always be recognizable immediately, although during early infancy impaired nerve vitality frequently shows itself in convulsions, meningitis, and other forms of nervous debilities. Many children of alcoholic parentage show signs of stupidity, mental deficiency, moral instability, and lack of normal control, while others exhibit idiocy, epilepsy, and hysteria, together with various abnormal cravings.

In a single reformatory school in the city of Berlin hereditary taint due to parental alcoholism is shown in 67 per cent of all pupils. Public attention is now being directed to the "problem of the feeble-minded," and those experts who have devoted most attention to the subject regard alcohol as certainly one of the most prolific causative factors in the deterioration of brain tissue, which lies at the real root of the mental inability and feeble-mindedness of so many human beings of this the twentieth century civilization. Of the 55,000 school children examined in New York City in 1901 by Doctor MacNicholl, 58 per cent were below the required standard of intelligence, 17 per cent being actual dullards, bordering on imbecility. The family histories of 3,711 of the children were traced through three generations. This was done in great detail with regard to the taking of alcohol. Of the children of abstaining parents and abstaining grandparents only 4 per cent were "dullards," whereas of the children of abstaining parents, but drinking grandparents, 78 per cent were dullards or feeble-minded.

If one-half of the money expended for the mental degenerates, idiots, imbeciles, epileptics, and paupers caused by alcoholic drinking were properly spent toward the prevention of these conditions, we would not only save millions of dollars, but in addition to this we would soon have a healthier and more refined civilization.

Our friends of the "Fatherland," the Germans, have made some recent pathological discoveries resulting from the much beer drinking of that country. It is known among the physicians connected with the large hospitals of Germany as "beer-drinkers' disease," and is recognized by a special condition of unhealthy enlargement of the heart, due to dilatation, accompanied by some increase of tissue and fat.

It is reliably reported that one in every sixteen of the hospital patients in Munich die from this disease.

Since beer drinking has become so popular in the United States during the past quarter of a century, we may anticipate about the same results. In fact, when we consider the greater quantity of the stronger drinks to which the American people are addicted we may expect a higher rate of mortality among the beer-drinking classes of this country.

This disease manifests its worst symptoms in persons between the ages of 40 and 60 years. It is not generally realized by the laity that such small amounts of alcohol taken in the form of lager beer and other soft drinks is fraught with so much danger, but it is nevertheless true, as well as appalling to think of. At such an age a man should be at his best, both mentally and physically, and with prospects of a good old age. Their loss to the community in which they reside is

incalculable when we consider the deplorable fact that many of our most prominent citizens and leaders of men are numbered among the beer drinkers of our country.

In considering the matter of national physical proficiency as well as national pride, steps of a most radical character should be taken toward removing the cause of these abnormal conditions.

When we consider the high standard of mental and physical requirements for military service of some of the other progressive nations, it is high time for our Federal Government to take cognizance of these facts and conditions.

It is thought by some of our learned thinkers that with a continuance of our present rate of deterioration, both mentally and physically as a nation, it will be only a matter of time when we will be classed with France and some other wine and alcoholic drinking nations of the earth.

It is a well-known fact that this marked deterioration on the part of the wine and beer drinking nations is now provoking the most lively consideration by educated men and heads of these various governments.

The most careful investigation reveals the fact that alcoholic beverages are no longer entitled to a place in the army or navy, in the camp, or on the field of battle. It is now recognized by our best authorities on military matters that the most severe exertions can be best endured, either in cold or hot climates, without any form of alcoholic drinks. It is a most significant fact that the Boer army withstood the long siege of warfare with England and displayed their wonderful power of endurance over their warm-blooded antagonists without spirituous drinks of any kind.

On the English side we have the comments of Sir Frederick Treves, who commanded the relief column of 30,000 soldiers that marched onto Ladysmith during that extremely hot weather when so many of the soldiers lost their lives on account of the great humidity and extreme heat. He remarked that the first men who dropped out of the ranks of this enormous column "were not the tall men or the short men, not the big men or the little men—they were the drinkers, and they dropped out as clearly as if they had been labeled with a big letter on their backs."

It was claimed by some of our older writers that spirituous drinks relieved fatigue and made privation more endurable. This, in a measure, is true when applied to the drinker and to the coward who does not measure the extent of the danger to which he is exposed, and on that account scorns the thought of danger. In the earlier times, when the method of fighting was to run down the antagonist by a wild dash, alcohol no doubt had its devilish effects on the brain. But modern scientific warfare has other features to reckon with; tranquillity, cool deliberation, iron endurance, a steady hand, a clear eye, a quick decision, etc., are some of the necessary qualifications which the warrior of the present day must possess in order to make the rifle in his hand a formidable weapon. He must be imbued with courage and loyalty that springs from love of family and country, and not with that drunken tumbling into danger with which one whose brain is clouded with alcohol rushes into battle.

As previously intimated, in considering the enormous fact that we have in the United States about three million hard drinkers whose ages vary about as much as the ages of those who are now enlisted in

our navy and standing army, saying nothing of the millions of young and middle-aged moderate drinkers of this country who are following in the footsteps of their parents and grandparents, and who will be followed by their children and grandchildren, is it not about time for the scholar and scientist to speak out a warning note of no uncertain tone? Should we not, as a convention of broad-minded citizens and conservators of the public health and public weal, make a bold effort toward arousing the slumbering senses and open the eyes of our Federal Government to the stern realities of the picture that now confronts us as a nation?

Mrs. M. J. Annable, of Brooklyn, N. Y., vouches for the record of one woman who, having been reared in the atmosphere of the saloon and the lowest form of immoralities, died a few years ago at the age of 51. Her descendants were traced from 1827 to 1902, and numbered in all 800, 700 of whom were criminals, 342 were confirmed drunkards, 127 were immoral women (prostitutes), and 37 were murderers, and they were executed for their crimes. This woman, through her progeny, cost the United States \$3,000,000.

In conclusion, permit me to present for your serious consideration a few side pictures, in the form of statistics, that continue to "bob up" in the background demanding attention.

First. We have now in the United States 3,640,000 hard drinkers of alcoholic beverages, 125,000 of whom die annually from the direct effects of alcohol; over 5,000 of these take their own lives.

Second. During the past four years alcohol killed more people in the United States than were killed by bullets during the four years of our civil war. In 1907 there were 10,782 suicides in the United States.

Third. The use of alcohol as a beverage costs the United States annually \$1,200,000,000.

Fourth. Eighty-five per cent of the crime, 75 per cent of the pauperism, and 50 per cent of the insanity of the United States are caused by alcohol.

Fifth. Seventy-five per cent of the diseases of fashionable life are caused by alcoholic beverages.

Sixth. Forty per cent of all diseases of the liver and kidneys is caused by alcoholic drinks.

Seventh. Sixty per cent of the inmates of all reformatory schools are the descendants of parents or grandparents who were addicted to the use of alcohol.

Eighth. Sixty per cent of all the imbeciles and epileptics of the United States is caused by the hereditary effects of alcohol.

Ninth. In 1905 the amount of alcoholic beverages consumed in the United States was 1,694,392,765 gallons; 1,494,191,325 gallons was lager beer.

Tenth. In the year 1890 the liquor traffic paid into the United States Treasury \$157,485,982. It cost the people of the United States directly and indirectly \$1,884,027,982.

The late Mr. Gladstone made the emphatic statement that alcohol was a greater curse to any nation than war, famine, and pestilence combined.

Notwithstanding this array of scientific facts and figures, our federal and state governments continue to issue license for the sale of a poisonous beverage that is slowly but surely destroying our nation.

THE EFFECT OF ALCOHOL ON TEMPERAMENT AS IT RELATES TO RACE AND NATIONALITY.

By WILLIS B. PARKS, *Atlanta, Ga.,*

Editor of the Altruist.

Much has been written in regard to the effect of alcohol on the human system, taking humanity as a whole. The consensus of opinion, according to the results of experimental research and investigation, is that alcohol is more or less deleterious to the human system, either in large or small doses. We may say, then, when alcohol is ingested into the human system that the effect is pathological.

We will ask permission in this short paper to discuss the effect of alcohol manifested according to temperament of the individual with regard to his race or nationality. However, we may remark that alcohol first gained its stronghold on humanity by its seductive effect when taken as a beverage.

This being true, no doubt, but that it was the untutored laity that suggested to the physician that this delusive beverage should have first place as a panacea for most of the ills that humanity was then heir to. We acknowledge with shame and regret that many physicians of this enlightened day are still following the same old traditional suggestion. As we consider the wide divergence in temperament, between individuals of different nationalities, even the simple habits and temperament of primitive man, we find that they all come under the same ban, of the one curse, known as alcohol.

For instance, the unsuspecting phlegmatic Englishman, who is generally characterized as a good feeder, even to the extreme of gormandizing, permits the delusive beverage to prolong his repast until he becomes an habituate with his gouty diathesis.

The nervous and impetuous Frenchman would seek the volatile absinthe for the purpose of soothing his quaking nerves, that he may coolly challenge to the field of honor the one who had on some occasion given an offensive "snub."

While the good-natured lymphatic German, through his social habits, will often repeat his order for "zwei Bier," while he laughs the evening away with his friends until finally he succumbs to "Leberkrankheit" before he reaches the stage of delirium tremens.

The bilious temperament of the Italian predisposes him to drink deep the "wine that moveth itself aright in the cup," that it might give him courage to plunge the stiletto into the vitals of his adversary.

But of all the inebriates who are a menace and a terror to his country, it is the brusque heavy-shod Russian, who drinks the intoxicating vodka that he might more easily carry the heavy yoke of oppression until in his fiery frenzy he revolts at oppression and hurls the bomb at the carriage of the passing despot.

The nervo-sanguine Irishman feels that it is his first few drinks that sharpen his mother wit, but he usually closes the scene with a drunken broil with fist and skull fight, even on the occasion of celebrating the anniversary of "St. Patrick's day in the morning." Through his good nature he becomes one of the most helpless inebriates.

The sanguine bonnie Scotchman will drink and sing, and sing and drink his intoxicating Scotch whisky until he reels and falls to sleep, the prolonged sleep of a Rip Van Winkle, or ends his pitiful career by the sad termination of alcohol paresis.

In considering the Jew and alcohol, his racial identity and traditional peculiarities eliminate, in a measure, the effect of alcohol as it relates to his temperament. The question has been asked, "Is the Jew immune to alcohol?" "According to some authors, the influence of race has more to do with immunity to alcohol than temperament or religion." They say that the Jew must possess a hereditary immunity to narcotic poisons, and in particular alcoholic beverages. It is pointed out by those who have studied the question: First, the Jews form a small, very compact community, and because of this intimate cohesion, of their isolation from the rest of the population, they are distinguished by very rigorous customs; second, they never adopt occupations necessitating great physical effort.

Judaism generally has preserved up to the present that character of a collective and social bond which other nations and races have lost somewhat, and it is this very force of cohesion and concentration of the compact community that preserves the great mass of Jews from alcoholism.

Come with me, if you please, across the Atlantic into one of the greatest countries that has been populated by a civilized people—the United States of America. Here we find a heterogeneous, enterprising people, with the highest mark of civilization and progress. It would be practically impossible to classify this heterogeneous people with a specific temperament, but here we find a blending of all the temperaments that can be found separate and distinct in each of the European countries, and, as might be supposed, it is here that every type of inebriety is conspicuously evident.

We know that alcohol heredity has not had as long a period to develop in America as it has had in European countries. Yet, on account of environment and the heterogeneous temperaments we believe that we have it here in this country marked even with more heredity and neurotic tendencies.

Such an abnormal condition seems to be contradictory, for those who came over in the *Mayflower* and those who came later had all of the elements of heredity acquired from the mother countries. But it is a historical fact that on account of the deprivations suffered by those who were to settle a new and undeveloped country the tendency was to modify the habits of high living and much wine drinking. As a consequence, for quite a long period the people of this then new country enjoyed sobriety long enough, in a measure, to overcome the ancestral alcohol heredity. But, as indicated before, the environments and the flattering inducements for fortune and fame, together with heterogeneous temperaments, have prematurely precipitated a people of the highest type of American achievement into an alarming state of drunkenness and inebriety.

In considering the effect of alcohol manifested in temperament of race and nationality we must include the North American Indian and the negro, which are two races distinct from the Caucasian. Without special investigation we doubt very much if there could be found a typical inebriate among our Indians; but no doubt, on account of his ancestral proclivities of hunting for the purpose of killing and slaughtering game, he has the deep predominating spirit of murder in his heart. This being true, he becomes a serious menace when his restraints are released by alcohol intoxication.

When we attempt to consider the effect of alcohol in regard to the temperament of the negro as a race, we are necessarily in a measure confronted with the much perplexed question—the negro problem. As a native of the South, I have made a study and some investigations as it regards the negro and alcohol. After investigations in hospitals and in all parts of the South I have never been able to find a confirmed inebriate among the negro race. While the negro is immune from dipsomania, yet he seems to have a special thirst for all kinds of intoxication. He is an easy victim to cocaine, probably from an economical standpoint, for he can obtain the intoxicating effect from cocaine at a smaller cost than from alcoholics. This thirst for intoxicants may be explained on account of his recent savage state, upon the principle that there is constant strife between his savage state and the civilized state, intoxication having a tendency to relieve the tension between savagery and civilization. The reason that he is immune from dipsomania is that he did not drink alcoholics to excess during his slavery and that there has not been time, in a little over forty years, since slavery was abolished to produce hereditary conditions. I will admit that it is a common occurrence to see the negro drunk; but a debauch does not affect him as it does the white man, for the negro can lay all of one day in extreme drunkenness and resume even hard manual labor with very little inconvenience the next day. I have never known delirium tremens among the negro race, which also strengthens the theory that the negro is not a victim to alcohol heredity.

Another interesting feature is that the mulatto, even with great excess of white blood, seems to have all of the characteristics of the full-blooded negro in this respect. Just how he should be immune from dipsomania or delirium tremens with a very little negro blood in his veins is more than I can account for.

In order to appreciate some facts that are evident it will be necessary to consider some peculiarities that are characteristic of the negro. The negro seems to have three attributes that predominate in his make-up—emotion, imitation, and lust. It is through his imitative faculties that he can easily acquire education, which is more perceptive than reflective. Higher education does not obliterate his three attributes, but seems only to change their manifestation. For instance, higher education will curb his lust while it engenders a fond hope of social equality and miscegenation. We of the south are heartily in favor of educating the negro, but we believe that the time required to educate him correctly should be hundreds of years instead of forty. His religious tendencies, which are easily called into extreme action, come through his characteristic emotional nature. It is remarkable, to those who do not understand the negro,

that he of the middle class will without hesitation exhibit great religious enthusiasm soon after leaving the scene of the chicken roost.

The lustful proclivities of the negro come through his predominating animal nature, and with the lower class, when under the influence of alcohol intoxication, he will at times attempt to commit the unnamed crime when almost in sight of the lynching mob.

Mr. President and gentlemen, who can marvel at the wave of state-wide prohibition through the South, for it has come to the period that without it the safety of our Southern womanhood is in jeopardy.

I will close with the remark that I wish it was practical for this august body of honest, hard-working scientific men to memorialize Congress to pass laws for the purpose of curbing the shipment of whisky into prohibition States.

THE PHYSICIANS' PART IN THE TEMPERANCE MOVEMENT.

By Miss CORA FRANCES STODDARD,

Secretary of the Scientific Temperance Federation Bureau, Boston, Mass.

Last autumn the New York Times published a symposium on alcohol, wherein various and diverse views were expressed by a number of more or less well-known physicians and scientists. Shortly afterwards Doctor Jacobi, of New York, published in the New York Medical Record a letter of protest against the appearance of such articles in the secular press and asked if space was lacking in medical journals for such discussions.

The next issue of the Record contained a counter opinion by Dr. J. M. W. Kitchen, of New Jersey, who said that the general public was calling on the medical profession to make a more definite statement as to the physical effects on the human body of the moderate use of alcohol than has yet been declared.

This latter opinion seems to be the one to which many physicians in all parts of the country are arriving. The word "prophylaxis" is beginning to be applied to alcoholism, as well as to typhoid fever, tuberculosis, and social disease.

The emphatic declaration of the Journal of the American Medical Association last September that the medical profession as a body should stand for temperance as one great essential of public health has been copied by the official organ of the American Health League, which is said to be preparing to take a part in the temperance movement.

This proposal of the medical profession to take a part in the struggle against alcoholism leads to the question, Where is their help most needed?

Part of the answer is indicated in the letter of Doctor Kitchen, cited above. He says people need the knowledge which physicians can give them on the following points:

- (1) The effects of the habitual use of small quantities.
- (2) The grasp of habit.
- (3) Whether the pleasures of indulgence can offset the resulting evils.
- (4) The correct interpretation of the seeming stimulation.
- (5) The relation of moderation to immoderation and loss of self-control.

There are other points on which physicians are also needed as teachers. The liquor traffic is industriously flooding the mails with false claims for its wares. A finely illustrated pamphlet recommends a certain brand of whisky as a "bracer" when one is fagged; as a relief

for summer "cramps;" to warm one up in winter and fortify him against chills; as a component of "food-drinks" for the convalescent; as an ingredient in "punches" for social functions.

An ale is credited, in flaring posters, as an aid to the muscle-worker and the brain-worker. It is said to "digest food" and "make red blood."

A widely circulated wine brochure urges the use of wine "to remove drunkenness;" to be served as a ration in the army and navy; to be given to children with their meals that they may grow up sober; to be used by ladies for invigoration when they are out shopping, or to serve in place of tea to callers.

In newspaper advertisements and pamphlets mailed to voters are the claims that beer is a muscle-building and blood-making food; a liquid food that strengthens and gives tone to the whole system; that it aids digestion, improves assimilation, and keeps up the weight and strength.

No class of people can so effectively correct the false impressions and mischievous suggestions created by these means as can the physicians.

Another class of false valuations has grown out of the recommendations of physicians in the past, and can only be corrected by the better informed physicians of to-day. Among the practices thus arising are the use of beer and port by nursing mothers to increase their milk supply; the use of gin for worrying babies and young girls to relieve pain; of "hot sling" to break up a cold; and eggnog to nourish or strengthen the delicate.

On all these points the people are being misled; have long been misled, and the physician is the one to whom they turn for light. He can and should be their rescuer from the inevitable consequences of ignorance.

Are all physicians prepared to be safe teachers concerning the beverage use of alcohol? The diverse opinions expressed in the symposium in the New York Times raises doubt as to whether many of the published expressions by physicians are based upon adequate examination of the existing evidence. If not, is the material needed for making a careful study readily available?

The Index Medicus is a tolerably complete guide to the most valuable and authentic works on most subjects which physicians are called upon to investigate; but one going to it for matter on the alcohol question misses much valuable testimony that has been given indirectly in the discussion of other subjects and is not therefore indexed under alcohol. Many physicians lack also the time required for obtaining the material referred to and for reading and translating.

To physicians who are truly desirous of helping in the rescue work demanded of them by the alcoholic customs of the times, the value of a bureau that has been steadily compiling for years the scientific literature on this question need not be emphasized.

Such a bureau is in existence under the care of the Scientific Temperance Federation of Boston. It contains not only the standard articles on alcohol in its relation to the human economy that have appeared in the principal medical journals, many of them translated into English from the German or French, but gleanings from numberless others not to be traced under the head of alcohol, besides many valuable reports coming from memoirs and transactions that have not

reached the editors of the *Index Medicus*. Carefully worked out cross references increase the value of the articles.

Another question that arises in connection with the physician's prophylactic work on the alcohol question is how he may most quickly and thoroughly disseminate the truths he wishes to teach. The Scientific Temperance Federation has established connection with the heads of more than twenty state, national, and international organizations through whom it can communicate to the remotest communities, and it maintains a press circular that carries information by request to over 150 editors representing nearly 10,000,000 readers. It has as corresponding members several of the leading students of this subject, as Professor Kraepelin, of Munich; Professor Aschaffenburg, of Cologne; Professor Laitinen, of Helsingfors, and others.

This organization is ready to use and to be used by the medical profession for that enlightenment of the people which alone can make the results of any temperance movement lasting.

Certain definite steps in this popular work have been taken by the federation. Through the Press Circular, of which mention has already been made, editors of some of the most influential publications in the country are being kept in touch with the progress of scientific inquiry on the alcoholic question.

The School Physiology Journal, primarily designed to assist teachers in giving accurate, up-to-date information in this subject to the young people in the public schools, is publishing each month articles of much value, many of them appearing in English for the first time, which are appreciated not only by teachers but by a wider circle of interested readers to whom this basis of fact constitutes the most convincing argument for temperance effort.

Popular literature has been prepared on wine and beer, exposing the fallacies of the arguments made by their manufacturers for their use, or pointing out the relation of drink to tuberculosis and other infectious diseases, and to degeneracy of various kinds.

A loan exhibit of colored charts prepared by the federation, representing diagrammatically the results of scientific study of the relation of alcohol to daily life, is proving to be an attractive and convincing educational method. Nearly thirty charts are now available and are used as illustrative material in informal addresses or, being self-explanatory, are used in the same manner as the traveling tuberculosis exhibits.

For reaching larger audiences, a popular stereoptican lecture is in use, illustrating the relation of drink to physical and mental efficiency, to cell life and development, to infectious diseases and other practical questions, all being based upon the facts ascertained by scientific research.

The scientific study of the alcohol question has taken it out of the realm of individual opinion and has placed it on the firm foundation of facts, which are not only convincing but fascinating when well presented. All arguments against the beverage use or sale of alcoholic drinks, reduced to their last analysis come back to these now well-established facts. Here, then, lies a most hopeful field of effort, and in this field the Scientific Temperance Federation is ready to cooperate with the physician who uses prophylactic methods, with the social worker who has learned that the ultimate elimination of the ills that afflict society lies in their prevention.

THE FUTURE OF THE ALCOHOLIC PROBLEM.

By T. D. CROTHERS, M. D., *Hartford, Conn.,*
Superintendent Walnut Lodge Hospital.

Public opinion in 1860 was distracted and confused. There were signs of revolution and change, and everyone was reading these signs and predicting what they meant.

The political horizon was a great tumultuous cloud bank of conflicting theories and opinions. To-day, in 1909, the political and social sky is overcast with doubts, theories, dogmatic predictions, and opinions of every sort concerning the meaning and direction of the great temperance movements, and a feeling of alarm is pervading all society concerning alcohol and the diseases associated with it.

The efforts of reformers have assumed startling prominence with revolutionary consequences, and the dealers in spirits are alarmed and read in these movements the doom of their business.

Everywhere—in the pulpit, press, and platforms—are explanations, predictions, and appeals concerning the alcoholic problem, but through all this there are unmistakable signs of the direction of the movement and the coming changes that are sure to follow.

In 1860 nothing was very clear and settled. There was a conflict ahead, and no one could predict where it would end. To-day there are unmistakable indications, through the gloom and confusion of theories, that a new era is coming, and that the solution of the great problem, with all its influences, is not far away.

Every advance in scientific study of disease and degeneration shows that alcohol is one of the most prominent agents and is very vitally concerned in the diseases and destruction of the human race. Statistical studies of the causes of accidents, injuries, diseases, and the great forces of heredity which enter into our civilization, bring out the same fact in greater prominence, that alcohol in some form is the most influential factor of these losses.

Medical, sociological, and economical studies all confirm these facts, and make prominent the conviction that alcohol in some way is a source of danger, recognized imperfectly, and yet powerful beyond measure, in degeneration and increased mortality.

These facts have created a sense of alarm in the public mind which is materializing in various ways and apparent in very remarkable forms.

Thus in the legislatures now in session in 34 States of the Union there have been introduced 221 laws restricting and regulating the use of alcohol as a beverage.

Sixteen of these laws urge the prohibition of both its manufacture and sale. Ninety-two laws concern the sale of spirits and the control of saloons, and others refer to punishment for violation of various enactments concerning the alcohol question.

A second indication, equally significant, is the fact that over two-thirds of the territory of the United States has specifically voted to prevent the sale of alcohol as a beverage. Such sections are called "drys."

There are over 1,000,000 men and women organized in societies and working through churches for the specific purpose of driving out the saloons and stopping the beverage use of alcohol.

In addition to this, there are over half a million voters who have expressed the same conviction in some form or other, although not in organized parties.

From these facts alone it is evident that the movement toward total abstinence is not the enthusiasm of reformers or a matter of sentiment among hysterical men and women, or even a psychological craze, but a deep-settled conviction of danger and a consciousness of the possibility of removing and destroying it.

It is becoming more and more evident every day that the theories which have come down from the past, and opinions and conclusions of our forefathers, however respectable and apparently based on wide experience, can not be accepted unless they are able to pass the bar of scientific inquiry and be judged in the light of modern science.

Thus the great evils, diseases, and questions of mortality, losses and obstacles which limit progression and development, are to be measured by the same standard and tested by a critical examination of the facts and their meaning.

The theory that alcohol as a beverage has tonic or stimulant properties, that came down through the ages to us with historical prestige, must be sustained by the laboratory research and clinical experience of this new century if it be accepted.

Within a half century research and experience have pointed out the errors of the past theories, and now it is proven beyond question that alcohol is simply a narcotic and depressant in its effects; that it has no stimulant or tonic properties, and that as a beverage it has no claim or reason for existence.

Consumption, insanity, epidemic diseases, and many of the great scourges of civilization are found to be the direct result of causes which are traceable and which move with a uniformity and certainty that can not be mistaken.

In the same way alcoholism, inebriety, marked by an insanelike impulse, or craze, for spirits with a full knowledge of the results, are traceable to causes and to physical conditions which can be understood, controlled, and prevented, with the same certainty as any other disease.

All questions of will power, moderate drinking, culture, control, have about the same meaning as dispensation of Providence, so often used in explanation of the mysteries of life.

A deep-seated conviction is growing in the public mind that the alcoholic problem is a physical and not a moral one, and that the same laws which govern the slow development of human life work with equal exactness in tearing down and destroying the unfit and removing those who disobey the exact requirements of physical laws.

The realm of devolution and degeneration is as exact and clear as that of evolution and progression. Theories which urge that alcohol in some way favors evolution and progression are really evidences of degeneration and devolution. Its warmest patrons and defenders are the most pronounced promoters of its destructive influence upon the race and upon civilization.

Everywhere the accumulated facts concerning the saloon and its influence show that its doom is near and the cosmic consciousness of its evil and the tremendous opposition to it show that its disappearance is only a question of time.

The pecuniary powers bound up with the manufacture and sale of alcohol, while making tremendous efforts to conserve their interests and prevent the destruction of their business, are strangely oblivious to the great commercial revolution that is rapidly coming into prominence. The stupidity of carrying on an organized combat with these mighty forces of evolution, and the money and energy spent beating the air and shouting to check the race march from the lower to the higher, is startling.

Scientific research has pointed out beyond question that alcohol possesses tremendous powers for heat and light which can be made force producers equal to electricity. Every year new discoveries show that alcohol can be made from a great variety of substances, many of which are now regared as waste products, and these can be produced very cheaply.

Already this has become practical in Germany and other continental countries where alcohol is manufactured from potatoes, beets, roots and other substances, and used for power and light at a cost of 20 cents per gallon.

As a fuel it is far superior to coal, wood, and oil, and in the manufacture of electricity it is cheaper than steam. The recent laws denaturing alcohol, rendering it poisonous as a beverage has opened up a new realm and new uses in the arts and in other directions.

As a competitor with gas and electricity, it has already been demonstrated to have equal and greater capacity for power and work. Inventors have turned to this problem, and have confirmed the wildest expectations and possibilities of its practical use in the world's work.

They have shown beyond question that the only obstacles are the discovery of apparatus and means to utilize it. To-day a small army of experimenters are working to perfect boilers which will make available the tremendous power of alcohol, and lamps and means to utilize this new force and turn its vast powers of light and heat into commercial channels.

Already great progress has been made in this direction, and the question is simply one of the means and methods of harnessing this great new power and turning it into practical uses. It can be made cheaply in great abundance on the farm, in the factory, and in every section of the country.

It will do equally as great work as electricity, and with that force it will bring about a new and higher civilization, enabling us to use both these forces in ways undreamed of at present.

The great liquor interests with its millions of money will turn to the manufacture of this product with greater profit and will find an increasing demand for it, and this is a positive indication of its future.

Alcohol as a fuel will take the place of coal, as a power it will supplant gasoline, and the great alcoholic problem will merge into the utilization of this force for the benefit of mankind and the world.

A number of different manufactories in the West have begun to change their products from refined liquors to crude alcohols for the trade. New inventions and new possible methods are growing in many directions.

Thus a tremendous revolution of industrial energies has already begun and is in sight and promises to constitute a new era in the economics of the race. The extinction of the saloon will follow early, and the change in the breweries and distilleries is bound to come, and the frantic efforts of the trade to obstruct will disappear.

Far-seeing men recognize this already and refuse to take an active part in the great proalcoholic struggle.

ALCOHOL: ITS PLACE IN MEDICAL PRACTICE.

By W. H. WAUGH, M. D., *Chicago, Ill.*,

Editor Clinical Medicine, etc.

When the writer began the study of medicine, the view prevailed that stimulation was but another name for whisky. If any person was permitted to die of weakness, it was the doctor's fault for not having pushed the whisky. True, we knew that if enough whisky was given the mental and physical faculties would be successively paralyzed, but we did not find it absolutely necessary then that we should be ready to explain everything; and the general truth and applicability of the above proposition were not seriously questioned.

Clinical experience gradually served to weaken this impression and the field for the application of alcohol became more and more restricted. The conviction was finally forced upon us that alcohol is not in any sense a stimulant, and that there is not a solitary clinical application that can be made of this agent, for which we have not other and better remedies.

It is now generally admitted that alcohol is in no sense a stimulant of either the mental faculties or the physical functions. In any dose it depresses the brain, the spinal cord, and the nerves. The increased activity sometimes following its administration is not stimulation, but due to depression of inhibition, with consequent lack of control. This applies to the mental processes. Small doses of alcohol weaken self-control and destroy self-consciousness. There is in no sense an increase of mental power following. This is true, no matter what the dose of alcohol may be or how it is taken.

It has been conclusively proved that alcohol is not an eliminant. After its administration there is often an increase in the excretion of urea and uric acid with the urine, and this led some to claim that herein lay the remedial virtue of alcohol. But it has been shown that this increased excretion is supplied by the food. The liver is so occupied with the task of intercepting and excreting the toxic alcohol that nitrogenous toxins in the food that would otherwise be thrown back by this organ into the bowel for excretion slip by this guardian of the vital portal and enter the blood, where they circulate to the discomfort and detriment of the individual, to be thrown out by the kidneys. In no conceivable condition of the human system could such a state of affairs be deemed advantageous.

From first to last alcohol is a depressant, weakening self-control, coordination, and the sway of the central nervous system over the physical functions, the control of the ego over the mental faculties. What, then, is the true cause of its repute? For there is always a reason underlying a popular belief.

Without adverting to minor considerations we may say that the value of alcohol is due to its power of quieting apprehension, and that of relaxing the tension of the blood vessels. One action gives the patient a "Dutch courage" that is really due to benumbing that sense of danger that might otherwise lead to the avoidance of disaster. The other allows freer transpiration of heat by the skin and somewhat betters nutrition by permitting a freer supply of blood; and by relaxing mental, physical, and moral tension induces a pleasant sense of rest and comfort. I think that as we realize that this influence extends to the three spheres comprising our being—the mental, the moral, the physical—and as we note how with the habitual drinker this sense of "ease" becomes continuous, we may see in it the sufficient explanation for the fascination exerted by this potent agent.

Relaxation, ease, rest, freedom from the obligations of labor, of endeavor, of conscience, from the spur of duty and the sting of remorse—surely there need be no quest for some mysterious underlying need of man's innate being to account for the universal craving for alcohol. The vinous pessimism of old Omar finds a ready response in many a world-weary soul. Lauder Brunton remarked that the reason so many men took to drink after passing middle age was, that when they realized what fools they had been they got drunk to avoid going crazy. Which remark touched the center of a great truth. The realization by man of his own limitations and inefficiencies is not always accompanied by that abolition of self-conceit that prevents his expecting too much of himself.

In general, the objections to alcohol as a stimulant are, then, that it is not a stimulant at all, but in all doses and in every sense a depressant, lessening the control of the nervous system, relaxing vascular tension, weakening the heart, increasing the production of heat, but lowering temperature by increasing the radiation from the cutaneous surface, and lowering the vital resistance. It interferes with the action of all the enzymes and only aids stomach digestion by an irritation of the mucous membrane which is very often undesirable, and when advisable may be induced by less objectionable means. It paralyzes the leucocytes and thus restrains them in combating invading microorganisms, rendering the assaults of the latter on the vital organism more effective. It interferes with elimination by occupying the powers of the liver, as we have shown.

With these general objectionable features it will be seen that alcohol contravenes every principle of modern therapeutics, which looks to elimination of toxins, conservation of the vital forces, with moderation of disease processes, as three great indications for the exercise of the physician's art. This being the case, we have to ask, What are the advantages in its clinical application that may counterbalance so many and such weighty objectionable features?

In shock, syncope, and heart failure we have imminent peril of death from sudden cerebral anemia. Alcohol further paralyzes the vasoconstrictors of the abdominal vessels and allows the blood to accumulate in their capacious recesses. Glonoin sends the blood to the brain, acts much more quickly than alcohol, and is here a life-saver. The effect of glonoin may be prolonged by the addition of atropine, whose power is developed more speedily when glonoin is simultaneously administered. The effect of this combination is

exactly what is needed; it is certain, and where time is so precious that a human life hangs on a few seconds' delay in getting one's remedy into action its almost instantaneous action is too precious to be lost.

As a stimulant to counteract the depression caused by sedative poisons alcohol is dangerous as being itself a sedative poison. Strychnine is here the remedy, with atropine and glonoin whenever cerebral anemia is a feature. In poisoning by the strychnine group the vascular sedatives and analgesants offer remedies surer, quicker, and more effective than alcohol.

The whisky treatment of snake bites is firmly implanted in the affections of the people; yet nothing in medicine is better proved than the fact that to the essential action of venom alcohol is synergistic. The danger here lies in parietic dilatation of the great abdominal vessels, into which so much of the blood retreats that the brain is left destitute. Alcohol increases this vasomotor paresis and consequently adds to the danger. It has been shown that this vasomotor relaxation is exactly remedied by strychnine, and that the patient's life depends on giving enough strychnine to exactly balance the effects of the venom, even though the dose required is such as would certainly cause the patient's death if no venom were in his system. Here again we find the indication for glonoin and atropine, but none for alcohol.

Typhoid fever: We have here presented one of the most remarkable contradictions in the history of clinical medicine, for in no disease has the use of alcohol been more urgently insisted upon than in this; nevertheless there is not an element of considerable danger in this malady which is not enhanced by this potent agent. Typhoid fever is a disease characterized in the first place by profound toxemia and consequent vital depression, and by a lack of that protective leucocytosis which is present in almost every other infectious malady.

As we have seen, the toxemia is increased by the use of alcohol, which interferes with the natural elimination of toxins by occupying the forces of the liver for its own destruction or elimination. Besides that, it inhibits the action of the phagocytes, and thereby lessens the natural defenses of the body. Moreover, we do not have in this malady the excuse for the administration of alcohol which is present in such emergencies as snake bite, because we have no sense of apprehension to allay, no need for Dutch courage. The patient is already saturated with toxins, and there is a general vascular relaxation throughout the body, which constitutes one of the principal dangers, leading to hypostatic congestion of the dependent parts, predisposing to a peculiarly perilous form of pneumonia.

The indication is for support and elimination, and support more decided than could be secured from alcohol, even though it really were a stimulant. All the elements of danger are enhanced by the use of alcohol, and it is a striking illustration of the truth that in no disease can a patient go so low and yet recover as in typhoid; that despite the almost universal use of alcohol the proportion of recoveries has been as large as it has. The modern treatment of this malady is, first, to keep the bowels clean and aseptic, and not leave poisonous fecal matter in contact with open intestinal ulcers. Elimination must be maintained; the vital forces must be sustained. In no malady is the problem of feeding presented with such difficulties or

of more importance. It is best solved when alcohol is omitted and foods given that can be absorbed from the stomach.

Much of what we have just said applies to the administration of alcohol in pneumonia. Here again we have peculiar difficulties, and the added toxemia, relaxation of the circulation and enfeeblement of the heart, with the increased afflux of blood to the lungs, due to the action of alcohol, all add to the danger. The tendency to delirium in pneumonia is also increased by the use of alcohol. Altogether one is tempted to say that if any remedy is formally contraindicated here, it is alcohol. Great success has followed the treatment of this disease by lessening the bulk of the blood and moderating the pressure on the heart, which is overexcited and forcing too much blood into the suffering lungs; by strengthening the heart when the slightest evidence of coming weakness is manifested; by regulating the vasomotor equilibrium throughout the body and sustaining the vital forces; while subtracting from the sum total of the symptoms of disease such as are due to depravity of the blood, from absorption of fecal matter retained in the bowel beyond the normal time. This applies to every febrile disease. In all of them alcohol can not but increase the danger, as interfering with elimination and relaxing vascular pressure, besides paralyzing the defensive phagocytes.

The one advantage which comes from the increased radiation of heat from the body is easily secured by other remedies, which have not the same objections.

Alcohol has also been urged in wasting diseases, occasioned by long suppuration, by impaired digestion, or by tuberculosis. In the first place we have effective remedies in calcium sulphide and other calcium salts, whose use stops microbic destructive action and promotes the reconstruction of the wasted tissues. By the administration of nuclein we also have the means of restoring the number and increasing the activity of the leucocytes, which are being destroyed in vast numbers in the contest with the micro-organisms occasioning suppuration. These remedies directly increase the natural forces of the body, which alcohol as directly impairs.

In the second class of wasting diseases, those due to digestive derangements, the indication is to restore digestion by the use of such remedies as are needed in each case, by a carefully regulated diet, and by the institution of a correct personal and domestic hygiene. Atony of the digestive apparatus may be relieved by the action of quassin or other bitter tonics. A better supply of blood can be directed to the digestive apparatus by the use of iron and similar remedies. The blood can be freed from fecal contamination by proper attention to elimination and the regular evacuation of the bowels.

In tuberculosis we have an acknowledged distinctly evil influence from alcohol with which to contend, and that is its tendency to favor the hyperplasia of connective tissue, with consequent atrophy of the cellular elements of the lung. This condition exists in all chronic pulmonary tuberculosis, and to a certain degree may be looked upon as a curative process. Nevertheless there is a tendency to the formation of cicatricial tissue beyond the desirable limit, and this is favored by alcohol. Moreover, it has been the writer's constant experience that tuberculous patients, when placed upon any preparation containing alcohol, tend to rely upon it more and more as a nutriment, and to the extent to which they partake of alcohol they consume

less and less real food. Hence the improvement which is claimed by them from alcohol is illusory, the effects here mentioned being most undesirable in every way. The increased cutaneous radiation leads to increased wasting in some cases; in others the normal healthy tissues tend to be replaced by useless and unhealthy fat.

Besides this, alcohol, as Metschnikoff has pointed out, exerts a deleterious influence upon the leucocytes, paralyzing these sturdy defenders of the human empire, and leaving the way clear for extension of invading colonies of tubercle bacilli and other micro-organisms.

The proper scientific treatment for tuberculosis would require a book. I simply point here to the importance of reenforcing leucocytosis by the use of nuclein, combating the numerous varieties of micro-organisms in the tuberculous tissues by saturating the body with the sulphides of arsenic and of lime, moderating the wasting fever by the use of the alkaloidal vasomotor regulators, purifying the blood and rendering it less suitable as a culture ground for the bacilli by preventing the absorption of fecal toxins; carefully regulating the digestive apparatus and securing every possible advantage that a well-selected diet, pushed to the limit of the patient's digestive capacity, will afford; the minute treatment of symptoms as they arise, and that attention to hygienic matters which mean so much to every individual patient.

Alcohol has been recommended as a remedy for persistent vomiting. Just why an irritant should be employed to sedate an already irritated stomach seems incomprehensible. The best remedy for such irritation is to keep the stomach absolutely empty until the irritation subsides. If a direct sedative is required, we have better remedies in cocaine, condurangin and bismuth, and in cases of severity small injections of morphine over the epigastrium. The action of these remedies is direct and unquestioned, and far more frequently and powerfully effective than alcohol in any shape could be.

A popular and most common application of alcohol is to take it in the form of a hot drink in order to prevent "taking cold," when a person has been exposed to cold and wet. Here we have to deal with spasm of the cutaneous blood vessels, when the blood is pushed into the interior of the body, where the circulation is engorged and there is danger of local inflammation resulting. A glass of hot water with camphor, or spice, frequently relieves this condition, and accomplishes the desired result quite as well as does alcohol. It may not be so pleasant to the patient's palate, but we are not dealing with the craving for stimulants but with medical matters.

Or the circulatory equilibrium may be more effectually restored, which is the actual indication for treatment, by the administration of aconitine and digitalin in combination, especially if taken in hot water, with a hot mustard foot bath or a general hot bath. Alcohol is unnecessary; it is not the best remedy, and it possesses a danger of its own, since we occasionally hear of patients falling dead from heart failure after a generous dose of alcohol taken under such conditions.

The physician who by practice has rendered himself proficient in the study of abnormal vasomotor conditions and in the application of remedies which are directly instrumental in restoring the circulatory balance, finds that charm in the practice of medicine which comes from one's knowing what he is doing and why he is doing it.

and from the security he feels that the remedies he employs will exert exactly the influence he desires. We relax vasomotor spasm by the action of aconitine, veratrine, or gelseminine, either of which at the same time improves nutrition by letting in a freer supply of blood and favors elimination by opening widely the doors by which excreta escape from the body. At the same time we relieve the vasomotor paresis, which permits of hyperemia or congestion, by the administration of digitalin or strychnine; the first of which sustains and strengthens the heart; the second strengthens and sustains the respiration, and by its influence over the nerve centers increases the control of the central nervous system and energizes every function of the human body. Our study of disease has taught us the importance of keeping the alimentary canal in proper condition, and preventing the absorption of toxins from fecal matter and of regulating the diet and other points of personal hygiene to the patient's needs and circumstances.

When one has accustomed himself to the study of the symptoms presenting in cases that come under his observation, and to fit thereto the remedial measures which are indicated in that particular case, from a study not of its dead anatomy but of its living physiology, he will inevitably find his applications of alcohol constantly decreasing until they arrive at the vanishing point. This has been the writer's experience, although he commenced the study of medicine with a firm conviction that alcohol was one of the prime necessities in medical practice, the conclusions herein stated being forced upon him by his clinical experience, against his will as it were, while he never allowed himself to be moved in the slightest degree by any other consideration than that of a determination to know and do what is best for his patients, in the way of promoting their restoration to health and prolonging their life.

Stockman concluded from his experiments that moderate doses of alcohol did not influence the pulse rate or blood pressure. Under large doses of the drug the blood pressure falls. Since it is certain now that alcohol does not stimulate the brain but depresses it, it is now asserted that it is this sedative action of which the physician makes use. If this action is desirable, however, we have other means of producing it, much less objectionable than alcohol. Few physicians would think now of giving alcohol to a fever patient as a sedative, especially since when this poison adds its effect to those of the toxins already in the body, we may have a furious delirium as the result.

Another claim recently put forward is that alcohol is beneficial because it retards cell action; but unfortunately the cell action which it impairs is that upon which we mainly depend for the continued existence of our patient; that is, the action of those cells which are engaged in eliminating the toxins whose collection in the body is the principal source of peril.

Medical men cling with unexampled conservatism to their practices and opinions. McDonald, who writes recently in the *British Medical Journal* a defense of alcohol in medicine, says there still remain a few practitioners with whom it is an article of faith to treat all cases of pneumonia with copious libations of brandy, but they are a decadent minority. But there are many who hold, as McDonald does, that alcohol judiciously employed forms an important part in

the treatment of this disease. We may look upon this also as a relic of that earlier belief represented by those just mentioned.

For some time after discontinuing the use of alcohol in other cases, the writer continued to employ it with those who had been accustomed to its use, in the treatment of grave diseases; believing that it would be unwise to call upon such persons to reform while struggling with a malady which in itself might prove fatal.

Here, however, I come in touch with the results obtained in hospitals, which discontinued absolutely and from the start the use of alcohol with patients suffering from delirium tremens. The fact that their results were better when alcohol was not used in any shape showed that even here alcohol was unnecessary. I therefore discontinued the use of alcohol even in habitués with pneumonia, typhoid fever, etc., and up to the present I can say frankly that I have had no reason to regret the change.

I will sum the matter up by saying that personally I stand ready to use alcohol at any time when I believe it is to the best interest of my patients, but that I do not know a solitary use or a solitary case occurring in the widest range of medical practice in which alcohol is the best remedy that can be applied.

In discussing this question I have left out absolutely all consideration of the moral effects and perils accruing from the use of alcohol, and have endeavored to look at the question simply from the standpoint of a physician who is solicitous to know what is the best treatment to be given to his patient in each condition of disease the doctor is called upon to treat.

SUMMARY.

(1) As a substitute, strychnine excels alcohol as a vital stimulant and an energizer of all the vital functions.

(2) In shock, syncope, and other forms of cerebral anemia, the combination of glonoin and atropine is quicker, safer, and genuinely effective.

(3) To quiet nervous apprehension and enable the patient to look with equanimity upon his condition, without embarrassing the surgeon by his dread of anesthetics, or of a proposed operation, an injection of morphine and hyoscine is much more effective than any quantity of alcohol that could be given, without adding to the danger of the condition as alcohol would certainly do.

(4) As a stimulant of digestion alcohol is not equal to quassin or other simple bitters, with such artificial digestants as the case may require.

(5) To prevent a cold or chill when wet, alcohol is not equal to a hot drink containing camphor or spice, or to a hot mustard footbath.

(6) As a remedy for pain, nobody would think of using alcohol, excepting in the absence of morphine, hyoscine, ether, chloroform, atropine, camphor, cannabis, or any of the other direct analgesants.

(7) In all forms of diarrhea and dysentery, it is now understood that the best treatment is to remove the cause of irritation and to soothe the irritated pneumogastric by the use of atropine, stopping microbin action in the alimentary canal by the use of intestinal antiseptics, and in case of dysentery soothing the irritation by single doses of emetine. There is no place for alcohol in this group of

diseases in the hands of those who know how to use the active remedies of our profession.

(8) As a hypnotic, alcohol may produce sleep by paralyzing the cerebral functions of the patient, a most undesirable and irrational method; or by momentarily equalizing the cerebral vascular pressure. In the latter case the same effect may be safely and quickly induced by administering a glass of hot water, or a few granules of aconitine, or of digitalin, according as the pulse tension needs to be lowered or elevated. Here again alcohol could only be used by those ignorant of the resources of modern medicine, and incapable of recognizing a pathologic condition and applying to it the remedy best calculated to restore normal, physiologic equilibrium. This applies to every application that could be devised for alcohol in the treatment of disease.

THE GREAT TEMPERANCE PIONEERS IN THE MEDICAL PROFESSION AND THEIR WORK FOR THE LAST CENTURY.

By HENRY O. MARCY, A. M., M. D., LL. D., of *Boston*.

It is often stated that the medical profession is responsible in a very considerable degree for the drink habit and the use of narcotics. To this charge the physician may in a measure plead guilty.

For the indefinite past, alcoholic preparations were believed to be, in the correct sense of the word, stimulants, although their narcotic effects were well known. When taken in large doses the direct and remote effects were accepted as injurious.

There have even been exceptions to this rule, both in and out of the profession.

In American medicine we find illustrious men who have given much time to scientific research work to show the effect of alcohol upon the human system.

Dr. Benjamin Rush, of Philadelphia, perhaps the most noted physician of his time, prominent in every good work, in civil as well as professional life, a signer of the Declaration of Independence, was pronounced in his opinion as to the evil effects of alcohol, both as a beverage and as a medicine. In 1785 he published a pamphlet of 32 pages entitled "An Inquiry into the Effect of Ardent Spirits upon the Human Body and Mind, with an Account of the Means of Preventing and of the Remedies for Curing Them." The entire article is worth a republication to-day. In an objective way he illustrates the effect of alcoholic drink by what he calls his moral and physical thermometer. I am indebted to Dr. Charles A. Ingraham, of Cambridge, N. Y., for an admirable historical address in which he refers to this article of Doctor Rush in a most complimentary way. He quotes the following as a curious anticipation of the modern gold cure as it took form in the fertile intellect of Doctor Rush. The association of the idea of ardent spirits, with a painful or disagreeable impression upon some part of the body, has sometimes cured the love of strong drink. This appeal to that operation of the human mind, which obliges it to associate ideas, accidentally or otherwise combined, for the cure of vice, is very ancient. It was resorted to by Moses when he compelled the children of Israel to drink the solution of the golden calf (which they had idolized) in water. This solution is made, as it most probably was, by means of what is called *hepar sulphuris*, was extremely bitter, and nauseous, and could never be recollected afterwards without bringing into equal detestation the sin which subjected them to the necessity of drinking it.

Somewhat recently I had occasion to examine a little carefully into the practice of medicine during the early part of this century by the leaders of the profession in Philadelphia and Baltimore. I was surprised to find that Dr. H. G. Jameson, of Baltimore, emphasized the injury that occurred from the then common habit of a reduced regimen, the use of calomel and other cathartics, and that he totally forbade the use of all kinds of spirituous liquors by his patients. Referring to his frequent and continued observation as to their injurious effects, he concludes by saying: "We must content ourselves, here insisting upon the facts, whatever may be thought of our theories."

Unfortunately we gather far too little of contemporaneous opinion from the writers of text-books. One of the chief attractions of autobiographies are the pen pictures of the period. In this respect the autobiography of the late Dr. John C. Warren, of Boston, is of exceptional interest. It portrays the so-called "Washingtonian movement," and I can hardly do better than let the doctor tell his own story, since it is contemporaneous and graphic:

In 1827 I joined the temperance society. My father, Dr. John Warren, was vice-president in 1813.

In the same year I brought forward temperance resolutions in the Massachusetts Medical Society, which, after a violent opposition, particularly from Doctor T——, were carried in a large meeting, with very few dissensions. The Reverend Doctors Channing, Gannett, etc., were the most active men at that time in the temperance cause.

From that period I have followed up the temperance reformation. Mr. Alden Bradford, Mr. Pierpont, Mr. William Sullivan then gave in their aid. Soon after the orthodox or Calvinist clergy took up the matter; and, by a slow and regular movement, the country was more or less brought under the influence of temperance principles.

In 1837 I went to England and conferred with the members of the British and Foreign Temperance Society, who were very cordial, and acted as chairman of a temperance meeting in the heart of the city of London.

In the same year I had a conference with some members of the administration of King Louis Philippe in France, and laid before them statements showing the importance and the progressive advance of the temperance reform.

About the year 1840, in consequence of the formation of the Washingtonian societies, the Massachusetts Temperance Society—the oldest association—suspended its proceedings, resuming their labors occasionally at such opportunities as occurred for making themselves useful.

In 1848 we made publication of the documents of the Massachusetts Temperance Society, recording the principal facts in its history. At this time (February, 1849) no licenses to retail are allowed by law in Boston and the greater part of the State of Massachusetts. The same is true also of several other States.

In the summer and autumn of 1849 I received letters from various parts of the country, requesting my opinion of the necessity of alcohol in *materia medica*. After some months' reflection I wrote a short article for general distribution, showing that in many cases alcohol was not necessary; that it might be dispensed with in the preservation of infusions; that in many cases of tinctures a substitute might be found in a wine produced by the fermentation of a vegetable infusion with sugar. This preparation I had made, and tested its effect, first, by taking it myself; second, by giving it to others. The preparation turned out to be mild, agreeable, and efficient in its operation.^a

In the course of the past summer (1849) the famous apostle of temperance, Father Mathew, visited Boston, partly on the invitation of the Massachusetts Temperance Society, on my application. I met him at the Roxbury boundary, and saluted him in a short speech, to which he replied. On the next day he drank tea at my house with Bishop Fitzpatrick, Mr. William Appleton, and others. Father Mathew employed some months in traveling about this State to give the pledge to many thousands of individuals, and afterwards visited the southern cities.

^a This article was published and distributed by the Massachusetts State Temperance Society.

For the last seven or eight years I have ceased to give wine at the dinners of the Agricultural Society and at other dinners; also at evening parties of scientific persons and others. In the early part of my establishment it was thought necessary for every young housekeeper to lay in a stock of wine, which might grow old and ripen; and at that time I used two or three glasses of strong wine daily, and at some periods brandy and water, though not strong. When I began to take an interest in the temperance cause, in the year 1827, I gradually gave up the strong wines and took the weak French wines. On going to Europe in the year 1837, I was led, while in England, to resume them, though not with good effect. Two or three years after returning from Europe I gave up the use of it entirely, except as an article of the materia medica, and always found myself better without it, except in case of unusual debility, when, used as a medicine, it has sometimes appeared beneficial.

On the whole, I can with confidence say that if I had never tasted wine my life would have been more healthy and longer and more comfortable. The efforts which I have been called to make in the temperance reformation, operating, as they have done, more extensively on the prosperity and happiness of the community, are a source of more satisfaction than any other labors. Probably my other occupations might have been as well or better performed by some one else; but perhaps it would have been difficult to find another person who would have been willing to undergo the opposition, ridicule, labor, and expense in the cause of temperance.

His biographer, Dr. Edward Warren, speaks of the customs of 1820 to 1830 in Boston, and states it was the prevailing opinion that all mechanics, farmers, or operators of any kind should receive a regular supply of spirit. Among the higher classes, not only wine, but alcohol in some form was in daily use. The smoking punch bowl in winter or the ice pitcher in summer was no uncommon addition to the sideboard, which was generally well supplied with every variety of spirit that the taste of each visitor could demand. Doctor Warren commenced his labors with great earnestness and with an interest which never abated through life.

He prepared a series of resolutions which were heartily adopted. They declared that the use of ardent spirits is unhealthy and inconsistent with a vigorous action of physical and mental power, and that the habitual use of wine is neither necessary nor salutary. Such resolutions were signed by most of the physicians in Boston, and published with a great beneficial effect.

The number of drinking houses was diminished and laws were enacted which greatly lessened the sale of liquors. Doctor Warren published a small, neat volume entitled *The Effects of Alcohol*, which was widely distributed, under the supervision of the Massachusetts Temperance Society, which was founded in 1813. In a record of this society, under date of January 27, 1857, is the following:

The council met at No. 2 Park street, Hon. Stephen Fairbanks in the chair.

The treasurer announced the receipt of \$2,000 from the administrators of the late Dr. John C. Warren, the same to be safely invested, and the income thereof devoted to the dissemination of temperance publications.

The limit of this paper permits reference to only one or two more of the great exponents of temperance among medical men.

The late Dr. Henry D. Didama, of Syracuse, N. Y., furnishes a noteworthy example. Early in life he became convinced that alcohol in any form was not alone unnecessary as medicine, but its use was generally harmful. For more than fifty years he was a leader in the medical profession in the State of New York, the founder of the medical department of the University of Syracuse, and a wise and tactful teacher and practitioner. At his death he was president of the National Medical Temperance Association. He published many articles upon the effects of alcohol in both health and disease. Many thousands still hold him in tender, loving remembrance, and I am

sure he felt that one of his most valuable services rendered was from his study of the deleterious effects of alcohol upon man. He was so sweet and tactful in his teaching that he made few, if any, enemies in the presentation of the subject, and even those who differed from him in personal practice were willing to agree with him as to conclusions.

Dr. N. S. Davis, of Chicago, is perhaps the most noteworthy example which the medical profession has furnished in the scientific teaching of the study of alcohol upon the human system. It has been my rare good fortune to have been a colaborer with him, as well as with Doctor Didama, in medicine for more than thirty years.

I am indebted to Dr. I. N. Danforth's recent life history of Doctor Davis. His first publication upon the subject which I have been able to find was an address delivered on Christmas Day, 1854—delivered at the request of the students of Rush Medical College, entitled "On the effects of alcholic drinks on the human system and the duties of medical men in relation thereto." The last of his many publications upon the subject was in January, 1904, entitled, "Is alcoholic medication necessary? In other words, is alcohol, as it exists in various fermented and distilled liquors, a necessary remedy in the treatment of diseases of any kind or in any stage of their progress?" During all the years of his long and remarkable career he was an active worker in the temperance cause, and no one will ever know how many men he saved from that terrible fate, the death of the drunkard. His hatred of alcohol was so intense that he was often called a "temperance crank," a "fanatic," a "faddist," and various other names which were intended to be opprobrious, but were in the highest degree complimentary.

It must be remembered that in Doctor Davis's early days the use of alcoholic beverages was rather more common than the use of "aqua pura," nor was it regarded as improper or specially harmful. The minister, the lawyer, and the doctor each took his "toddy" without any idea of its impropriety, and in the country stores rum was sold as openly as and rather more frequently than "lamp oil" or molasses. When the merchant made out his yearly bill against his customers—professional men included—the item "1 gallon of rum" occurred about as often as any other item, and the farmer generally needed an extra 10 gallons to "get through haying."

"It was several years after Doctor Davis had been a married man, or rather boy, and had graduated in medicine and become a legal voter, before the temperance cause acquired sufficient momentum to be respected or even felt. In those days it took some backbone for a young man to allow himself to be known as a 'teetotaller,' as the early temperance advocates were contemptuously called, but our young doctor, standing almost alone, swerved not a hair's breadth from his principle of absolute and uncompromising abstinence."

From the very beginning of his medical practice to his last days he absolutely prohibited the use of alcohol as a therapeutic agent, and not only that, but he talked against it to his patients, argued against it before various medical societies, and in his more public and popular addresses, and wrote against it in medical and secular periodicals far and wide.

It would be impossible at this day to gather all of Doctor Davis's essays and addresses against the use of alcohol in any form, either as

a beverage or as a curative agent, but if this could be done the collection would be about as formidable an array of antialcoholic literature as could be desired. Nor must it be forgotten that as long ago as he began practice, and in fact down to quite recent times, the use of alcohol in medical and surgical practice was not only very common, but its use was, by the majority of physicians, regarded as indispensable.

When he came to Chicago, in October, 1849, he brought his temperance principles with him, and they certainly seemed to thrive in the uncongenial atmosphere of this their frontier city, with its cloud of frontier vices. Of course he preached temperance to the students of Rush Medical College, and later to the students of Chicago Medical College. A little later he delivered and published a lecture descriptive of some original experiments in relation to the effects of alcohol on respiration and animal heat.

It is perhaps a fair and just statement to say that Doctor Davis came to be regarded as one of the best equipped men in the country in regard to the treatment, or more properly the curative management, of inebriety. He was chairman of the first finance committee of the Washingtonian Home Association; he was also chairman of the executive committee from 1865 to 1881. During all these years he was almost invariably present at the stated meetings of the executive committee no matter how inclement the weather or how crowded he might be with professional cares. As one looks over the early records of the Washingtonian Home one is amazed at the constancy of his attendance at the meetings of the executive committee, as well as the meetings of special committees, which were frequently required for special duties, and of which "Dr. N. S. Davis" was pretty sure to be a member.

It is well known to all medical men and to a great many of the laity that Doctor Davis was regarded as the father of the American Medical Association, now the most powerful and influential medical organization in the world. Of course his influence in the association was greater than that of any individual, and it is interesting to observe that he never missed an opportunity to urge his temperance doctrines upon this august body. Especially did he enforce his views as to the value—or rather harmfulness—of alcohol as a remedy for the treatment of disease in any form. In fact, he took the positive and rather radical ground that under no circumstances could alcoholic stimulants be regarded as necessary or even useful. The doctor presented several papers to the American Medical Association enforcing his views, all of which are published in official reports of the "Transactions" of the association. He also presented various papers based upon carefully conducted experiments before medical societies or other scientific bodies in various parts of the country, all converging on the single point of the absolutely toxic effects of alcohol, whether as a beverage or as a medicine.

By way of securing a favorable hearing for his views and of assuring their perpetuation among medical men, he aroused the movement which resulted in the organization of the "American Medical Temperance Association," in 1890, and at the meeting in Detroit, in June, 1892, he delivered an address on the "Objects of the American Medical Temperance Association," in which the work of the association was admirably set forth.

The experiences of the illustrious men which I have referred to in this paper cover the period of American history from the establishment of our independence to the present.

They had many colaborers of less note, but my object has been to show that the influence of the drink habit upon the nation has long been a subject of serious thoughtful scientific investigation. Such men live on in their influence into the indefinite future.

Their mantles have fallen upon worthy successors. Others in their turn will continue in the good work, for the battle is not for the day, and in one form or another injurious effects of alcohol will probably continue for generations yet to come.

THE PSYCHOLOGICAL BASIS OF INEBRIETY: ITS ÆTIOLOGICAL AND SOCIAL FACTORS; REMEDIES.

By TOM A. WILLIAMS, M. B., C. M., Edin., *Washington, D. C.*

Why should an individual be compelled to periodically debauch himself with a narcotic, in spite of a repeated, firm intention to never again even taste the poison? The author's inquiry during a temporary residence at an inebriate's home in England showed that a great majority of the 50 inmates broke their resolves through inability to overcome the impulse.

What is the nature of this impulse, what is its origin, why is it so irresistible; finally can it be overcome in those in whom it occurs, and how may its occurrence be prevented in others? If these questions can be answered satisfactorily, there need be no prohibition remedy.

That the longing is a state of feeling needs no argument. It is the call of the unsatisfied, of the miserable, of the depressed. It finds many answers, as that of Janet's patient (1) who solaced her unspeakable anguish by dropping boiling water upon her naked feet; or as that other extreme case, the oriental mystics, the dervishes, who gash themselves with knives, although in both these and the Christian mystics who mortify the flesh in other ways there is a definite religious purpose in the deed which they use to assuage their yearning. Their emotional longing is essentially the same as that of the drunkard—both seek intoxication. But in the mystic the means are mainly psychic; in the narcomanic they are a drug.

This feeling of intolerable longing and consequent discontent is the unfortunate appanage of certain individuals; but in most cases it has arisen from ignorance, and has been fostered by mismanagement.

The mother who seeks out every caprice of her child to satisfy it is laying the train for future explosions of uncontrolled impulse. The mother who neglects her child to the point of compelling him to seek amusement at all costs from any passerby, hence to discard everything which does not immediately please, is incurring many chances of her boy developing a habit of immediate satisfaction at all costs. Again, the parent who allows doctrinaire rigidity to alienate him from the sympathetic understanding of his child's innocent and harmless turbulence is driving him to seek elsewhere the modicum of solace which at least every child at times requires. A frequent outcome of this is the alternation of stoical self-suppression and outbursts of indulgence in what is believed to be wrong.

Whether the indulgences of states of feeling find their accentuation in alcohol or whether they use some other aid is a mere accident of environment. This accidental nature of the response to longing is shown by the experiments of Pawlow with dogs (2). Thus, by asso-

ciation of ideas, ringing of a bell could determine gastric flow, which could be again inhibited by the showing of a whip; and in turn any impression could be substituted for these and produce pleasurable or painful emotions, as well as increase or decrease in the secretions.

* * * * *

Longing may find satisfaction in religious searchings, taking the form of a desire for completeness and perfection. The brooding may eventuate in ecstasy, produced expressly and preceded by orison, so well described by Madame Guyon (21) and St. Theresa (22). An analogous phenomenon among the Wesleyans was called "the power." It was very puzzling to their founder, who, however, discouraged its manifestations.

Though these phenomena often arose from, and were fortified by, suggestions from without in the nature of religious rites or personal exhortations, yet they responded to a need of certain organizations, and betrayed a lowered psychological tension proceeding from physical nerve inadequacy.

This state is shown also, and more familiarly, by worry, despondency, bad temper, lack of decision in small matters, morbid introspection, overconsciousness, increased susceptibility to temptation of appetite, which more often are at the root of the addictions to drugs for the purpose of uplifting the depressed feeling.

In general, a habit reflex forms, and the early indulgences are those which persist, but it must be remembered how much greater is a desire for spiritual sustenance and comfort when the stress of independent industrial life combines with the decline of youthfulness. Hence the pathological indulgence of feeling in hurtful acts may be postponed quite late, although the pathological feelings had hitherto been there though restrained by self-respect, religion, the sake of decency, or fear of the criminal law.

Of the feelings, it is preeminently true that appetite grows by what it feeds on. The indulgence of the sickly sentimentality of what Nietzsche describes as "slave and woman morality," fostered by fond petting in childhood, is readily replaced later by the maudlin self-satisfaction of the sot; the riotous self-indulgence of the untrammelled child, unconscious of the very real limitations set him by an arduous world, finds its counterpart in adult age in the illusory happiness of alcoholic vainglory. The poet Burns knew this in saying—

Kings may be blessed, but Tam was glorious
O'er a' the illis o' life victorious;

as indeed he was where his immediate feelings were concerned.

Psychological experiment shows how persons differ from day to day in mental capacity. Physiological experiment exhibits the difference in bodily secretions and in activity. Such oscillations are as true of the feelings, depending, as these do, upon bodily changes and mental impressions. Nearly all of us, then, must necessarily encounter phases during which our feeling is one of incapacity, even of inaptitude, discontent, dislike of our surroundings, anxiety, etc. To support these unpleasant states a certain fortitude is required, unless one chooses to put an end to the state of feeling by some stimulus. The outcome of this course is the need for a very large stimulus to do away with a quite trifling feeling, for the power of resistance progressively decreases by nonuse, especially when a ready satisfaction is within

reach. The immediate satisfaction of desire at all cost is a habit which can be made or unmade at the will of the educator, and it is toward this factor that the prevention of inebriety must be directed.

The remedy is the teaching of mothers to form healthy emotional habits in their children. The happy-go-lucky absolutism which so often asserts itself as capacity is sadly defective as such a guide for hesitating childhood. The mind, the emotions, and their management into a morality constitute the most difficult study and art. Woman's sphere is here, and is indeed a noble one, but instinctive motherhood has had its day. The women who aspire to bring up leaders of men in a nation which aims at future greatness must cease striving for vain things and no longer confine their attention to superficialities, but do as their grandmothers did, and buckle to, modestly, earnestly, thoroughly, to an understanding of that fascinating complexity—the heart and mind of the child.

Even persons emotionally unstable may be readily taught to provide against the extra load this might mean. Simple faith has in the past been efficacious in this respect, at least among the uninstructed mass. Endeavors have recently been made to restore this function to religion by claiming a combination with the science of the mind. I need not particularize, for in essence none of the methods so far differ in principle from that employed by the priests and necromancers of what we now agree to be superstitions. In all, the means (3) consist of a rousing of the attention by rhythmic sounds, a succession of images and, especially among the more barbaric, ordered movements, more or less varied spontaneously. In this respect, the ancient religions showed themselves empirically more efficacious, for the reinforcing effect of active movement upon our thought is now an established fact. Will is nothing more than the balance of the concomitant stresses toward movement, and pedagogy has (4) taught us that present methods lack woefully that dynamogeny without which education is a mere name. In this respect, the modern world has been injuriously dominated by the armchair philosophers, who have neglected the facts of life, and, above all, the genetic factor. The notions of experimental science have not yet sufficiently penetrated the teaching of ethics. This has been left almost entirely in the hands of persons whose point of view is hopelessly vitiated by the artificialities of outworn conceptions of the universe and of the mind of man, which are maintained by the traditions of popular literature, academic philosophy, and ecclesiastical dogmata and ritual, whose nature precludes adjustment.

The philosophers of the past have seen the need of and have tried to enunciate laws for the mastery of the passions and moods. Their efforts were nullified by too exclusive a reliance upon introspection and by their referring to extraneous agencies, such as ghosts and good and evil spirits, the more marked manifestations of disordered affectivity. It is to the study of this in our day by Cartesian methods that we owe the genetic point of view which I will briefly indicate.

Moods and emotions, as Spencer (5) long ago showed, are the determinants of conduct. The direct power of idea and reason in modifying behavior has strict limits. However, the indirect effect is tremendous. Prevision, however, is the essential element of this control; and this prevision must occur before the formation of emotional habit. It is the very early years which form these habits.

The perversion of infancy and childhood through the neglect by parents of the knowledge we have for guiding the disposition of a child is most reprehensible. The overthrow of the method of obedience to the arbitrary desires of a parent ignorant of the evolution of the child's mind has been followed by the equally obnoxious "laissez faire" methods, conspicuously shown in the United States, where the emotions and behavior at least are concerned. The abolition of obedience as such has enthroned the immediate impulse as the ruling factor. Our next advance must transfer from the world of commerce, finance, and even science to the field of social relation and ethics, and even religion, the powers civilized man has cultivated for receiving wide, deep, and subtle impressions, collating these accurately and judiciously, and of acting not upon the impulse of the moment, but as the result of the total impressions stored in his mind. Unless education in ethics becomes as kinetic when applied to normality as it now is with regard to business and the law it will continue sterile. To do this, we must order the consequences of our children's acts in conformity with their powers of observation and inference. The surest forerunner of unreasoning conduct in an adult is a childhood which is taught to act without understanding and to understand without acting. It is because of this that wisdom has fallen behind knowledge, and that where manners and morals are concerned people act indiscriminately, conventionally, impulsively, or indifferently, thanks to the apology for training they have received in childhood. It is significant that whereas they are not so trained in the arts and sciences, it is in these wherein so much progress has been made.

The constant attempt to arrest the mental activities of the child by thwarting even his healthy impulses deprives him of initiative, and he becomes discontented unless entertained by others. This want of resourcefulness is a sure forerunner of ennui, of the loafing habit, of the need of something to pass the time, so prolific a source of drug habits. To prevent this, method, as in the universities, is more important than results. Didactically memorized precepts have no meaning to the childish intelligence; whereas education by deeds is pregnant with results. The events upon which the child has to base his inductions must be carefully chosen by the parent to conform to the limits of his intelligence, and of course must not be at variance with natural law; for example, when he shows cruelty to an animal, there is no real efficacy in telling him he is a naughty boy, but a great deal in presenting him with a pet able to resent and produce discomfort. Again, if he shows fear of an animal, exhortation meets no stored memories upon which to bear; but the familiarity gained by fondling an animal which does not hurt soon substitutes a new emotional complex for that of fear.

We expend millions of money, incalculable thought, and the health and lives of innumerable teachers upon the instruction of the intellect of the young by a curriculum artificially graded to meet the fancied needs of each period of childhood. The child is given meaningless problems in arithmetic to teach him to calculate; corollaries and inductions in mathematics to teach him to reason; dates and events in history and geographical details to teach him to remember; drawing, clay modeling, and manual training in general to teach him mus-

cular control. Something is taught of the arts of music, sculpture, and painting to teach him æsthetic appreciation, and even the sciences are touched upon to give him a notion of the world in which we live. But the object of all these, the first, intermediate, and last art, that of living in relation to others, is taught only in the most haphazard or arbitrary way or entirely neglected. Is it not reasonable, therefore, to demand for this at least the beginning of a graded curriculum, in which examples must be worked out by the student and in which he is taught "rule" by "practice?" The ethics which is taught in the rule of thumb way of the average family is still that of rudimentary survivals. It is conspicuous for its poverty in such criteria of modern civilization as justice, liberty, courtesy, altruistic sympathy. The natural good impulses of the child are even artificially checked and twisted; his reasoning from cause to effect where conduct is concerned is neglected or obstructed; he is thus confused, and finally discouraged into sadness or indifference, and is bred into a despondent or happy-go-lucky man, ethically speaking. Even if knowledge and freedom are ultimately attained, it remains difficult to throw off the affective accompaniments of conduct first practiced under such brutish auspices (6).

The responsibility for the different attitude which the child observes in his parents toward moral questions as against others must be laid to the door of religion; for the sacrosanct connotations of supernaturalism which pervaded morality in days of ignorance and repression have still survived, on account of the want of its scientific study and practice. On the one hand, we find a perpetuation into adult mental life of the helplessness and irrationality of the child; and at the other extreme is taught the inherent damnableness of human nature unless justified by faith. Need one insist upon the effect of either of these artificial attitudes, upon the cultivation of the power of observation, inference, and of reasoning in general?

Its effect upon the sentiments has been even worse; for in the child of careless or indifferent mind these qualities have been perpetuated by the attenuation of their results into a state of happy expectancy that the Lord will take care of his own. The second extreme will fall most heavily upon the child who is inclined toward overconscientiousness. The neurologist almost daily is presented with examples where this morbid trend has been cultivated to excess by the religious atmosphere legated by the apostle of Geneva.

As Tollner said, "Play of whatever sort should be forbidden in all evangelical schools;" but Fröbel has said, "Play is not trivial. It is highly serious and of deep significance. The play instinct affords the teacher and parent a ready opportunity of training the child into right ways of living."

Now, the cultivation of either the happy-go-lucky disposition or that of hyperconscientiousness is bad for that intellectual and affective poise which is the best safeguard against the psychological state favoring inebriety. A disposition toward carelessness is fortified by the constant leaning upon others; the scrupulous disposition is fostered by misplaced reliance upon the so-called intellectual determinants of conduct. To the child these are meaningless, because they are mere symbols of something he can not understand, owing to want of motor experience. That which makes a concept effective is its motor element; without this it is quite incomplete. It might nearly be said

that an idea which has never been kinetic is impossible—that, indeed, the notion is not in consciousness; all that is there is the simulacrum constituted by the verbal image. A familiar example is the child's "chart in Heaven," which shows how little he was conscious of the real meaning of the Lord's prayer.

The truth of this is implied in the old proverb, "Example is better than precept," but the implication depends upon the fact that this example can be understood and hence rendered kinetic by imitation, while precept conveys comparatively small meaning. Consider the concept of a dog. The real properties of this creature come only from personal contact. The child by mere gazing and hearing can gain no knowledge of the dog's weight, roughness in gamboling, painfulness of claws and teeth, the difference between long hair and short, and so on.

The kinetic element is more important still in the acquisition of an art, such as the working of wood or métal. "On devient forgeron en forgeant," and only so; but these experiences must not be forced at undue age, or the painfulness of their acquisition will bring disgust instead of pleasure. As accomplishment is learned, the kinesthetic element tends to fall more and more into the background, and to be represented visually and auditorily; but it is nevertheless present, and once more emerges during states of mental dissolution. It is the real basis of knowledge, and the neural stresses entailed by its inhibition from activity have important functions in the associational processes. Examples abound. Isaac Newton was at the foot of his grade at 12. He showed neither ability nor industry. Charles Darwin was not at all a studious boy. He writes:

To my deep mortification, my father once said to me, "You care for nothing but shooting, dogs, and rat catching."

Rosa Bonheur in her eleventh year generally contrived to avoid the schoolroom, and spent most of her time in the woods. When placed with a seamstress in order to learn to sew, she implored her father to take her away, which he did, and, much perplexed, left her entirely to herself; and Rosa, full of unacknowledged remorse for her incapacity and uselessness, sought refuge from her uncomfortable thoughts in his studio, where she learned her art as a solace, in play.

A vast majority of parents and teachers do not appreciate the tremendous possibility of character building through play, and they try to subdue it in the child, thinking it is something he should overcome, forgetting that when the time comes it will pass out of his life, and it will do so as naturally and readily as the tail of the tadpole is absorbed when there is need of the legs of the frog. The hilarious enthusiasm of childhood and youth will in time develop into the eager earnestness of the business man, the soldier, etc. As said Stanley Hall (7):

There is a sense in which all good conduct and morality may be defined as right muscle habits. As these grow weak and flabby, the chasm between knowing the right and doing it yawns wide and deep.

As F. W. Robertson said:

Doing is the best organ of knowing.

This must become the dominant note in the pulpit itself as soon as the preacher seeks to know what the soul really is.

That this is being realized is shown by the playgrounds movement, which in Germany are used as developer of the inventive and creative instincts, and for the growth of muscle, mind, and morals. In Eng-

land this is done in the national games, which are a part of the curriculum in the better secondary schools. In these games the masters themselves not only supervise but participate, and in this way encourage fortitude and the spirit of fair play, and restrain, or at least guide, the exuberance and natural brutality of the boy. As a matter of fact, phylogeny shows us that the most valuable lessons of life should be taught in play. For instance, in the gambols of young rabbits it is the mother who teaches them to enter and leave their burrows quickly. In the menagerie one may see the parent lion or tiger teaching its cub to leap from ambush. W. J. Long believes that the old beavers set the young ones to work building dams in summer so that they will have learned to do so when required, and all this is done in and as play.

But educators, unfortunately, think that they have discovered a better way than the natural one; and our little children were, and still are, forced, against all the instincts of life, away from their play into schools, where in many cases play is rarely permitted. As a result, they are suffering from arrested development of the will, as well as of the emotions and the intellect. No wonder Fröbel insisted—

Wouldst thou lead the child in this matter, observe him. He will shew thee what to do.

The child in a palatial nursery may lead a life even less desirable than that of those in shops and factories. He too may miss the stages of distinction only possible with constant reactions to healthy environment. Even though not stunted physically, he is certain to be so mentally and morally; for as James has said:

The boy who lives alone at the age of games and sports will usually shrink in later life from the effort of undergoing that which in youth would have been a delight.

And so with traits of character, they must become reflexes in childhood and youth, or the opportunity for their development will have passed. Otherwise we shall crush out characteristics upon which future strength depends, and force the growth of untimely virtues, which will never become mature. Take pugnacity for instance; it is generally suppressed in modern education, which forgets that the "good man is not the man who never fights, but rather the one who does, and fights for the right and in defense of the downtrodden." Similar arguments may be used with regard to selfishness, anger, cruelty, rude humor, venturesomeness, and other so-called evils. As a matter of fact, the boy who can not play, if he has had the opportunity, is not capable of work; for both work and play are merely the use of the surplus of energy after breathing, digestion, and circulation of the blood have been accomplished.

The superiority of play as against work in the development of a child's character is due to the interest it gives. This stimulates effort, without which development will be imperfect. Indeed activity made without effort conduces to bad habits of action, slovenliness, and lack of will power—the want of forcefulness.

Regarding altruism, play is again the best developer. The small child can not but be selfish; he can not see the need of cooperation. Group games will gradually teach this. For instance, little boys have no acknowledged captain; but later, the efforts to play well and for the team to win make necessary the subordination of certain individuals for the good of the whole, and so first a temporary and later a

permanent captain must be selected. From this develops a respect for law and order, the will to submit to discipline and amenability to the results of its infraction. The unselfishness thus derived is an active force in the future man's life; it is kinetic. Hence we may no longer say that knowledge alone is power; and we may say, again with Fröbel:

A comparison of the relative gains through play of the mental and physical powers would scarcely yield the palm to the body. Justice is taught, and moderation, self-control, truthfulness, loyalty, brotherly love, courage, perseverance, prudence, together with the severe elimination of indolent indulgence.

Premature attention to the inhibition of motor activities in the development of man prevents the development of the psychological systems, without which capacity can not be attained. Resolution becomes permanently "sicklied o'er with the pale cast of thought;" and, moreover, not only are the activities incomplete, but those which develop are incommoded by the constant fear brought by an over-active conscience. As James (8) has asked:

How can social intercourse occur in the sea of responsibilities and inhibitions due to the self-centered horror of saying something too trivial and obvious or insincere or unworthy of the company or inadequate to the occasion?

Now, the tremendous friction of a life of restraint upon normal activity causes nervous exhaustion, and this feeling is so painful that one readily flies to what removes it. Hence inebriety.

On the other hand, there is danger in the noncultivation of inhibition, for impulsiveness then rules, and this meets with innumerable inducements to intemperance of all kinds. But its cultivation must not conflict with ontogeny, and above all must be kinetic.

It is from these two extreme types that are mainly recruited the intemperate.

As may be readily perceived, the treatment differs radically in the two types, the latter of which may be called the hysterical, the former the psychasthenic. The words are used in the sense given them by the modern French psychoneurologists, represented, respectively, by the schools of Babinski (9) and Pierre Janet (10). A few words must be said of the two diseased conditions connoted by these terms. As I have remarked elsewhere (11), "the very important diagnosis between hysteria and psychasthenia depends upon the following: First, as to fixed ideas, their duration in hysteria tends to be long, for though they are easily buried and forgotten, they are resuscitated with great ease and infallibility; whereas in the psychasthenic the fixed ideas are very mobile, but keep recurring voluntarily, and indeed become cherished parts of the individual, and are far more difficult to eradicate than those of the hysteric. Secondly, hysterical ideas are evoked by well-defined and not numerous associations, "suggestions;" in the psychasthenic they are often evoked by apparently irrelevant associations, which are searched for by the patient; thus the points de repère are very numerous, can not be predicted with certainty, and are often mere excuses for crises of rumination or tic. Thirdly, in the hysteric the ideas tend to become kinetical, whereas the psychasthenic's constant state of uncertainty causes him to oscillate between 'I would' and 'I would not.' Inhibition is too strong to allow an act, but not strong enough to dismiss the obsession."

Psychasthenics are naturally fitful eaters, and every heavy meal will cause an intoxicative metabolic upset, which will produce the conditions for an exacerbation of psychasthenia, which in turn readily induces inebriety. If in the treatment attention is drawn to this, food and appetite scruples may be produced and hence undernutrition, and even hypochondria. Therefore it is best to dose the repasts while training the judgment, and not to tell the patient until his critical impersonality is better cultivated.

Another cause of psychic perturbations which call for extraneous stimulus is illustrated by the case (12) of the woman who had been prescribed 3 grains of caffeine each day. After eight months of frequent attacks of angiois she gave it up, whereupon the attack ceased. She, however, resumed the drug; but the attacks recurred and she relapsed again and again, until finally she ceased the caffeine. When one remembers that this is only the quantity contained in one and a half cups of coffee of average size and strength, or in about three cups of tea, a frequent and insidious cause of nervous depression is strikingly revealed.

Psychasthenic needs and insufficiencies may be imitated by suggestion (13); e. g., when vacuity of mind occurs, attention naturally concentrates on the desirability of something to remove it. The first thing thought of constitutes the suggestion. It may be mischief, as in a crowd of hooligans and schoolboys; it may be an impulsion to move, as of horses in a field, the rapid contagiousness of such movements being there well seen. The stampeding of military horses is a well-known example. Accustomedness and training turn these vacuous trends toward work or profitable amusement like the arts of music, painting, and sculpture, and other interests. Hence the value to most people of a hobby. The vacuousness, boredom, is worse at night in some persons. Suspicions may form; and such ideas, easy during dejection, have often been reenforced by the superstition that they are instinctive, e. g., it has been believed that Mohammedans detest pork by nature, whereas they really do so from suggestion and imitation in childhood. Similarly, fear of the dark is inculcated, and not merely instinctive as the study of pædology shows. A striking instance has recently come to my attention where entire fearlessness in the dark marks the three girls of a mother whose life was a burden to her on account of the terrors learned from superstitious negroes, although she no longer believed them.

It is essential to supply occupation of vacant moments for suggestible persons failing strength of psychic constitution or its substitute in philosophy or moral training.

Again, intemperance in eating (due to bad childhood habits, eating being a very strong instinct then) lowers feeling of wellness; and this leads to want of stimulus; hence desire for an uplift, such as alcohol when used to it, tobacco, etc.

Another cause conducing to a psychic state favoring inebriety is the impelling, by an ambitious or art loving desire, beyond one's endurance, which entails consequent loss of sleep, hasty meals, unsettledness, and anxiety often justified by business oscillations. I recollect a letter sorter who broke down on account of the added stress caused when he wrote novels, and poor things they were. Foolish ambitions are most rife in suggestible people, whose critical power is low. They make misfits; and constitute the windbags so

rife in public and official life. These are the penalty of all government. Lack of ability must be compensated by extra work. Many a broken down professional man is a spoiled barber or plowman. The effects of these extra loads depress the psyche, and lead to desire for stimulus, and hence to inebriety.

A form of addictive tendency, unfortunately too common, is that induced by the reaction of the patient against some disappointment, disgrace, or other psychic trauma. In its essence this is what psychologists call a defense reaction, and further analyzed is one of the varieties of what Dupré (14) has termed mythomania. The appetite for distinction, the dislike of neglect, determined to be fed and having no means for satisfaction through exhibition of talent or capacity to perform in some useful way or from indolence or cowardice of disposition, resorts to the extortion of sympathy by its perseverance in a suffering in which the patient indeed comes to believe.

Sympathy and praise removes depression or vacuity of mind, titillates the psyche. A child who has learned to lean upon others is a candidate for false neurasthenia of this type when later in life some business or social project miscarries. When a person is ruined or slighted or when ambition fails, neurasthenia is often diagnosticated and a rest cure imposed or drink flows to terminate the suffering.

A remarkable case has just come to the writer's attention (15). It was that of a naval yeoman, who, after rapid promotion, of which he had reason to be proud, utterly broke down on account of the exactions and irritability of a new commander whom he could not please. His state of health eventuated in his desertion, although this stigma was later removed from his record. His symptoms were morosity and loss of interest and stamina, impotence, and overpowering desire to get away from his distressing environment and to go to his mother. He also seriously thought of committing suicide. He became suspicious to the point of believing that the object of his persecution was to promote over his head his clerk, who had been longer in the service and was more efficient than himself, though too unreliable for the chief post. As soon as he felt that he was in an asylum and free from the risk of having to return to an environment he could not stand he began to improve and recovered within three months. All the time he was glad to believe himself insane; and indeed while under treatment before going to the asylum had run away from home with the vague idea of finding employment. Although well in other respects, he still interpreted his experience as an attempt by the commander to supplant him.

The state of mind from which this man suffered is very common as a consequence of failures of ambition, disgrace in business, politics, etc. The reaction depends upon the psychic make-up of the patient. The mental alienation by no means invariably tends toward suicide. It may take the form of religious remorse, and very commonly consists of resort to so-called stimulants; in such a state drunkenness is easily acquired. Early schooling in buoyancy under adverse contingencies not only tends to prevent the development of the paranoid state shown in this patient, but makes the reaction to the paranoid syndrome less unhealthy than suicide, drunkenness, or even general suspiciousness.

A fourth type of inebriate differs from the three foregoing in not being a psychopathic; it is represented by the man who drinks to

excess (without very obvious detriment to his efficiency) on account of the habits pertaining to his environment. A drayman, commercial traveler, or our "three bottle" ancestors are examples of this type. Such people have not taken to alcohol on account of mental depression or through want of will or even from pleasures of the palate or general feeling. They are not inebriates until their will is destroyed by years of intoxication; their psychic degeneracy is acquired, not inherent. The number of this class is rapidly diminishing with the spread of knowledge of hygiene with regard to intoxicants. To the intemperate advocates of the temperance movement is perhaps due some credit for this improvement; their agitation has at least kept the subject in the foreground, and thus directed toward it the scientific research of which our present knowledge is the fruit. An example is that of the poor lad who consulted me for nervous breakdown due to alcohol which he had first learned to take because at the age of 13 he looked upon the big boys who did so as heroes.

I have purposely refrained from speaking of the psychological effects of alcohol; this problem of physiological experiment has been clearly solved by the researches of Horsley (16) and of Kraepelin and his followers (17). There is no longer any dispute about alcohol's paralyzing effect upon neuron activity as measured psychometrically. The more complex is the neural process the more detrimental is the intoxicant.

But the problem we have to face now is the means of preventing these injurious effects, by studying the factors which lead individuals to incur them. I am well aware that the psychological factor is only one of these; and I have accordingly emphasized its relation to the pedagogical. Economists, sociologists, criminologists, and legislators may occupy themselves with the various factors of the problems which pertain to their respective sciences; but without a precise determination of that psychological character of the individual against which they must direct their efforts, their labors must be sterile, even if not injurious. Hence it is upon the student of morbid psychology that each and all must found their procedures if they wish to build rather on rock than on sand and to hew a step more in the advance of humanity toward the perfection it seeks.

Again, when a tendency to inebriety recurs, when founded upon one of the psychic perturbations indicated, it is to the student of morbid psychology that recourse must be had. The developments of psychic therapy in our day are greater than I can even attempt to outline, so complex are their ramifications. Suffice it to say that in them we find an answer to the despairing query of Hamlet, "But who can minister to a mind diseased?"

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THE TURKISH BATHS IN INEBRIETY.

By CHARLES H. SHEPARD, M. D., *81 Columbia Heights, Brooklyn, N. Y.*

It is commendable for us to review the past and thereby gain wisdom and strength to meet the new problems of the day. That, if nothing more, justifies our gathering here. We feel that our cause is a holy one—the enlightenment of the community as to the real effect of all narcotics on the living body. This knowledge will result in the total abolition of the saloon and the disuse of alcohol in all edible or medical products, for why should intelligent manhood continually swallow disease and destruction as his daily food and drink?

We may well rejoice in the progress that has been made, but by no means have we reached the limit. There is one eternal progress that is continually carrying us along, and still greater victories are in sight. There is yet to be a greater temperance, wherein all narcotics shall be inhibited and a higher life of freedom from its complexities shall obtain.

Inebriety is such a dominating fact and so fruitful of ruin to thousands in our community that the study of its inception and the means of its amelioration are forced upon every humanitarian. Prominent, if not the first of its causes, is the financial one, and though philosophers have given us many theories concerning the progress of poverty, it still remains with us and is likely to continue until, in some future time, society shall deal with it in the broad, generous spirit of cooperation. A few years ago an extensive investigation was made in England, under the auspices of Lady Somerset, to ascertain the causes of intemperance, and the conclusion arrived at was that 86 per cent of the whole number were directly traceable to poverty or financial causes, and the great cause of this 86 per cent was summed up in one word, "competition." In this country the investigation of Prof. J. J. McCook showed that the large increase of vagabondage, including tramps, in the years 1874 and 1894, was directly traceable to the panics of 1873 and 1893. Prof. F. S. Nitti, in *Economic Journal*, says:

The working classes, swayed by instinct, rush eagerly to stimulants, and the workman is inclined toward their use in proportion to the poverty of his food budget.

Intemperance as a cause of poverty has been greatly overworked, both by temperance reformers and by optimistic economists. It is a great cause, but it is not at all certain that it is the chief cause. A medical journal says:

When medical men begin to study the cause and cure of poverty and its dreadful effects upon God's creatures, the sick and weary at heart may hope for a millennium. Poverty is a disease of present social conditions and needs our thought as much as the oncoming of a plague of cholera.

Another cause of the prevalence of inebriety arises from the popular confidence in alcoholic drinks and other narcotics, and this confidence

is largely bolstered up by physicians who freely use narcotics. With good reason may the layman say that if alcohol is valuable as a medicine it necessarily must have some virtue as a beverage. The testimony of science is daily refuting this theory, and the misery and disease brought about by its use is constantly emphasizing this truth.

When we realize the great importance of the fact that alcoholism is not only a curable but a preventable disease, we will not hesitate at any effort to alleviate the condition.

The central idea we wish to present now for your consideration is a means of prevention as well as cure, and this may be stated in a few words as the establishment of a new habit among our people—that is, the habit of the bath. From earliest times bathing has been utilized as an important agency in treating the sick, and its efficacy as a preventive of disease, as well as a remedy, is daily evidenced by unparalleled success when administered by competent hands. New remedies are vaunted for a short or long time, as the case may be, only to fall into quiet desuetude; but baths have ever remained to bless and benefit us by their revivifying influence. There are many varieties of baths, some good and others very good, but the most complete form of all is ordinarily called the "Turkish" bath. One who has not studied this subject can scarcely realize the beauty and magnitude, as well as the utility, which this form of bathing attained during the Augustan period of the Roman Empire.

Physicians of every school, as well as the common sense of mankind, agree that cleanliness is the very first requisite to health. If a man's blood is pure, he is not only less liable to disease, but when overtaken by such calamity his recovery is more quickly assured. Disease comes largely from impurity of the blood, which is the result of improper living, and this condition is more promptly relieved by the sweating bath than by any other process.

Can we not teach the people to give more time to rest and recuperation and to a study of the laws of health, with less devotion to stimulation? If it is wished to place the inebriate in the condition most favorable for cure, it is important that there should be institutions created for that purpose with desirable surroundings, as well as control over the patient. The model institution is yet to be built, by and under control of the State, wherein the hot-air bath shall hold a pre-eminent position, where narcotics shall be entirely disallowed, for it is not much improvement on inebriation to have one's system saturated and senses blinded by narcotism.

It was not until such self-sacrificing men as Doctor Turner, Doctor Parrish, Doctor Mason, Doctor Crothers, and a few others made plain to the community the true standing of the inebriate that a right appreciation of such cases was obtained. They showed that this disease was one to be treated on the same general principles as other disease. Nor should the noble, self-sacrificing work of Doctor Day be forgotten. He, with others, have passed on, but their work remains to us as a guide and a blessing.

Dr. J. Edward Turner was a man born over fifty years ahead of his time, with a natural overflowing sympathy for his fellow-man whenever he found him in distress. He gave his life to the work of benefiting the inebriate. We are constantly acquiring proof of the soundness of his advanced ideas as they are daily put to a practical test. His name heads the list of workers in this field, as he built the first inebriate asylum in the world. The corner stone, after an unparalleled amount

of work on his part, was laid in the year 1858, at Binghamton, N. Y., and the institution, which was opened for patients in 1863, was carried on under his administration for three years with great success. Many who were his patients then have since been useful and honored members of society. The history of that institution, after he was forced to leave it, shows how the most beneficent enterprise may be wrecked by bad management.

A prominent feature in Doctor Turner's plan of treatment made it necessary to isolate the patient from the possibility of obtaining alcohol in any form, and to continue this exclusion long enough to make a complete cure, the time varying in different cases according to the condition of the patient. It has been demonstrated over and over again that unless entire exclusion can be obtained the treatment requires repetition. There are many reasons why an institution is essential for the care of inebriety as well as for many other diseases. The appliances for treatment are more complete than can be possible in the individual home; the supervision of the physician is direct and constant, and therefore the attention is more prompt; the surroundings of the patient as to sanitation, diet, etc., can be better regulated, and the uniformity of life, as well as treatment, all conduce to a speedy recovery.

When we have secured an institution, or at least placed the patient out of the reach of narcotics, then comes the restoration of the functions of the body to their normal working condition. It is well known that the action of alcohol, as well as narcotics generally, retards the waste of tissue, and some have imagined this to be an advantage, but, on the contrary, the system, by the free use of these agents, is often loaded, as it were, to the brim, and is ready at any moment to be discharged like a cannon at the touch of a match, and for this reason they are more dangerous. Notice how many of those who make a free use of them are suddenly stricken down while apparently in what should be the vigor of life.

The action of so-called stimulants, as well as narcotics, is in reality a toxic effect, mistakenly supposed to be stimulation, and, like other poisons, the system resists them, as they are nonassimilable, and therefore the easiest method, by what may be called vital reaction, is taken to get rid of them. When from excess or weakness this result can not be accomplished, what may be called a benumbing effect is produced. The longer alcohol remains in the system the more will this effect be perceived, and this, being in the nature of paralysis, must naturally act in a progressive ratio until the impairment of the functions of the organs is succeeded by an inability to work at all. How would it be possible to go on, day after day, bathing the internal organs with dilute alcohol without its inducing some kind of disease? The elimination of this substance from the body, with its irritating compounds, necessarily falls largely upon the kidneys and skin, and when these are overworked, disturbance quickly follows. Whenever elimination is suspended, inasmuch as one or more of the organs engorged. This is particularly disastrous as far as the brain is concerned, for the brain gives way most quickly after the reception of alcohol, and then proper coordination is interfered with, and we see the gradual approach toward insanity or idiocy, the trembling nerves, and finally utter incompetency.

The more frequent practice is to introduce a drug into the stomach in hopes that its action will be such as to correct this dominating

morbid condition. Necessarily this drug or potion must be absorbed, pass into the circulation, and then produce its effect. Were it possible to produce an antidote to the action of alcohol or any other drug, all would rejoice, but more often the result is an additional poison which the system is called upon to throw off through the excretions of the body, if possible, and while the symptoms may be changed, frequently the trouble is increased rather than relieved. The laws of life and health must be strictly obeyed, in spite of any so-called remedy, and we may rest assured that these laws are as inflexible as the law of gravitation. The time will never come when we may ignore any one of them without paying the full penalty. It will ever be found necessary to give strict attention to the laws of sanitation, nor can we reach the highest standard of health until they are fully understood and obeyed. To go on in the way of transgression and then expect to be bailed out by some new remedy is as likely to prove as futile in the future as it has in the past.

Modern researches show most conclusively that poisons are the largest factors of disease, and such conditions are mostly due to toxic substances generated within the body, either as a result of a failure in the process of oxidation and elimination or the action of microbes. In acute inflammatory diseases the system is struggling to expel a poison resulting from the growth of microbes. Typhoid fever, scarlet fever, diphtheria, and cancer are familiar examples. In many chronic conditions the body is filled with poisonous substances, the result of an accumulation of waste matters through defective elimination. When a person is drowned, he dies from retained poisons. Experiments have shown that fatigue causes chemical changes in the blood, resulting in the production of a poison resembling the curare poison. The act of coughing is simply an effort of the nervous system to free the mucous membrane of the throat from obstructive excretion which would be poisonous were it retained.

There is no doubt that putrefactive processes in the intestinal canal play an important part in many diseased conditions. The investigations of Selmi, Brieger, Pasteur, Frankel, and Martin confirm this statement. Bouchard, in his auto-intoxication, clearly shows that self-poisoning is only prevented by the activity of the excretory organs, chiefly the kidneys, and by the watchfulness of the liver, which acts the part of a sentinel to the material brought to it by the portal vein from the alimentary canal. Lauder Brunton has shown that disease depends upon the products of putrefaction and fermentation, rather than upon the direct action of the microbes upon the tissues. Depression of spirits, restlessness, stupor, and melancholia are among the results from auto-intoxication.

The one great fault with our people is the use of improper foods and drinks that satisfy not and lead to excessive alimentation. This is followed by a morbid craving. Ignorance supposes that stimulants are the one thing needful to satisfy this morbid craving. We well know that nothing will so speedily quiet the nervous storm as the ever-convenient and alluring alcohol, and it does secure, for a time, rest and repose, but at a fearful expense of nerve strain, after which comes an increased desire for further stimulation. This, oft repeated, is sufficient to break down the most vigorous constitution. Another serious effect of alcohol is its direct tendency to interfere with nutrition, and by promoting the growth of cellular tissue to com-

promise the integrity of the brain tissue where the poison is not readily thrown off, and where it soon destroys not only its coordinating power, but degenerates the brain substance. We know that with the inebriate there is a lack of fine moral sense, and that this condition is far-reaching, even affecting the progeny.

The following, from a report of the Belgian commission, is most emphatic. In brief, it says:

First. All alcohol is injurious. It is never a tonic or stimulant and never increases the vital powers, but always lowers them.

Second. No form of distilled spirits has any nutritive value.

Third. The injuries of alcohol are always transmitted to the next generation.

It has been shown by the French writers, Duroy, Perrien, and Lallemand, that unchanged alcohol has been found in the urine.

It has been proven by Kerr and Strumpell that the action of alcohol, when brought into the system in repeated small doses, is nerve destruction.

Demme, of Berne, says:

According to the majority of investigators, absorption and assimilation are diminished in rate by small doses of alcohol.

Even alcohol applied to the skin is an irritant, and, if persisted in, will cause ulceration of the skin.

There is one agency that accomplishes many of the results that different drugs are given to produce, and this without the reactive effect of the drug, and that is always delightful, soothing, and quieting to the irritated nerves.

That agent is the hot-air bath.

The moment the bather enters the heated chamber of this bath he is called upon in the gentlest manner to discharge, through the skin, the refuse of his system. The process of unloading goes on readily and constantly, and the longer he remains in the heat the more foul material is thrown out. The skin is made active; the blood is perfected in its circulation; at the same time the elements of disease are discarded. Thus, when there is alcohol in the system, it can be distinctly noticed in the perspiration. It is apparent to the sense of smell, when alcohol is used in even a small degree, and much more so when it is freely used. As the blood is brought to the surface and purified it goes back to every organ to do better work and perfect every function, by carrying new elements of repair and nutrition, by which all the activities of life are renewed, so that, unless the work of destruction has been carried on too long, repair is set up and a better condition of things organized. For instance, if the kidneys have been inflamed, the inflammatory and obstructive particles are eliminated, the former irritation is quieted, there is less determination of blood and nervous energy to the part, through the general equalization, so that a normal action follows, and this vivifying process goes on, not alone with the kidneys, but with every organ of the body. Then, again, the manipulation which accompanies this treatment renders more perfect every process, and in a large measure takes the place of exercise. Nothing could be more simple and perfect in its action. The effect is constitutional or general, and thus quickly overcomes all local obstructions, and the process needs only to be repeated and continued long enough to reach the most depraved cases.

The daily round of human life is a repetition of processes of building up and breaking down. This change is taking place everywhere

in the human body, with the result that brain and muscle are finally resolved into carbonic acid, water, and ammonia. These changes necessarily take place much more rapidly while under the influence of hot air, and a person's whole system may in this way be promptly and completely renewed.

By no means will this process restore a lost arm or a wasted lung, but by its action many an arm that by reason of inflammation was unfitted for service has recovered its full activity, and many a lung that was not doing half work has regained its normal action, and the brain that before was cloudy has been cleared and its pristine activity reinstated.

The theory of the action of the hot-air bath is very simple. Like the action of the sun's rays upon Bunker Hill Monument, when shining upon one side and causing it to lean toward the other, so does this agent act gently and yet powerfully. The primary action of heat, which is the one essential thing of the Turkish bath, is to relax the tissues of the body and thus invite a more perfect circulation to every part of the system. By this active circulation, every sense is quickened, the secretions are more thorough, the excretions more complete, the blood is better supplied with oxygen, the skin assumes its natural roseate complexion indicative of the improved condition, and each and every function, whether it be that of the lungs, liver, spleen, or bowels, comes in for its share of the general benefit; in a word, it opens every pore of the skin, and hence results the most perfect sewage of the body.

The secondary action is that resulting from the profuse sweating, where water from the blood and débris, or used-up tissue and poison held in solution are rapidly thrown out of the body. Crystallized salts have been noticed forming on the body of a rheumatic patient while in the hot room of the bath. The quantity of blood in the body is lessened by the free excretion which takes place through the skin and lungs, the body weight is reduced, and the work of the heart in this way lightened, at the same time that its substance is better nourished by the improved quality of the blood supplied to it. The peripheral arterioles of the body, too, become dilated and filled with blood, thus affecting a corresponding emptying of the blood vessels of the internal organs. Lastly, as a result of the alternate cold and warm douching the vaso-motor energy of the vessels is increased, thus rendering them more capable of resisting any strain that may be incurred. By this it will readily be seen how quickly congestion is broken up, wherever in the body it may be located, and the offending material thrown out through the pores of the skin. Under such conditions absorption and elimination have their most perfect opportunity, and equalization of the circulation crowns the work. It is evident that alcohol is soon eradicated under such favorable conditions and that torpidity gives place to activity. Furthermore, no living tissue or vitality can be extracted by this process. Nothing is thrown off but what the system is better without. One bath has been known to relieve an intermittent pulse, giving a smooth, regular action to the heart, indicating a well-balanced circulation. What known drug can do this in the space of one hour? Another great advantage in favor of this treatment is that there is no poison left in the system to work its way out, as is the case when drugs are administered; on the contrary, the individual is left in a calm and quiet frame of body, which necessarily reacts upon the mind.

It must therefore be evident to every medical mind that the remedy which will stimulate every organ and create in it an action to throw off diseased conditions is a true one to meet such cases. With how much more reason must we expect even better results in the case of inebriety, where the cause of the disease is eliminated and the advantages of treatment are greater. The mucous surfaces of the inebriate, and in a minor degree those of the moderate drinker, are in a chronic state of inflammation. The effect of the hot-air treatment is to reduce that inflammation by purifying the blood, that is, eliminating the destroying elements, and thereby relieving that immoderate craving for stimulants, that only perpetuates and increases the disease, instead of giving relief. A man thoroughly purified by one of these baths at once realizes that he is a cleaner man and on a higher plane; his senses are more acute; he is in his best condition; he respects himself so much the more, and is less liable to return to his base practices. It is stated as a fact that in no country has inebriety been found coexistent with the bath. Temperance and cleanliness are its handmaids.

When the inebriate can be kindly taken from society, of which he is unable to fulfill the duties, and be cared for until he is again fitted for its privileges; when the younger generation are taught, as they should be, the disastrous effects of stimulants and narcotics in any form, thanks to the noble work of the lamented Mrs. Mary H. Hunt, this is now being carried out in most of the public schools of our country, and when the Turkish bath forms a necessary adjunct to every habitable institution and is made generally accessible to the people a brighter day for mankind will dawn upon the world.

To prevent the development of inebriety we should work for this enlightenment of the community and also for the establishment of public Turkish baths. They are democratic institutions and will continually tend to the social improvement of the masses by helping to level up its devotees to a higher grade of life. Through placing the body in its most vigorous and pure condition the mind at once receives its full share of the stimulation, and the affairs of life will be viewed from a broader and a cleaner standpoint. In that way it will help the building up of the nation. It is by the culture of the physical that we uplift the whole man.

While it is remarkable how largely the Turkish bath is available in the relief of diseased conditions, it is capable of still more wonderful service in the rôle of preventive medicine, inasmuch as this bath renders its frequenters immune to disease by its purifying processes. Stop and think of the thousands that are lost to the community from easily preventable disease. It is lamentable that such a highly sanitary measure should not be thoroughly applied. Herein is a golden opportunity for wealth to magnify itself and enrich all the people.

In fact, the eliminative power of the Turkish bath is so simple and yet so far reaching that its possibilities have not yet been appreciated. Truly we have here a field of almost unlimited range and of blessing to the whole community.

As it was said in olden times, the simple things of life are continually confounding the wise ones of the earth.

When our people, like the Romans of old, awake to the importance of public Turkish baths, and model them after those of early history, the glories of a new era, which is slowly but surely coming, will illumine our daily walk.

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